November 2, 2001

Ms. Sandy Olinger (AMSAM-EN)
Building 3206 Redstone Arsenal
Huntsville, Alabama 35898

Field Investigation Report (Rev. 1)
Determination of PCB TSCA Waste Quantities
Building 3, St. Louis Army Ammunition Plant
Contract No. DACW41-00-D-0019

Dear Ms. Olinger:

Arrowhead Contracting, Inc. (Arrowhead) is pleased to submit Revision No. 1 of the Field Investigation Report for the Determination of PCB TSCA Waste Quantities at Building 3, St. Louis Army Ammunition Plant, St. Louis, Missouri. A distribution list for the Field Investigation Report is attached. The report incorporates review comments received by October 29, 2001. It also contains updated discussions with regards to structural considerations, matrix spike/matrix spike duplicate analyses, investigation-derived waste characterization, and asbestos-containing-debris considerations.

If you should have any questions regarding the report, please call us at (913) 814-9994.

Sincerely,

Greg Wallace for

Greg Wallace, R.G.
Project Manager

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Superfund

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Enclosures

Cc: See attached distribution list

CONSTRUCTION CONTRACTING
12920 Metcalf, Suite 150 • Overland Park, KS 66213 • (913) 814-9994 • FAX (913) 814-9997

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FIELD INVESTIGATION REPORT
DETERMINATION OF PCB TSCA WASTE QUANTITIES
BUILDING 3
ST. LOUIS ARMY AMMUNITION PLANT
ST. LOUIS, MISSOURI

(Revision 1)

PRE-PLACED REMEDIAL ACTION CONTRACT
CONTRACT NO. DACW41-00-D0019
TASK ORDER NO. 0002

Submitted to:

Department of the Army
U.S. Army Engineer District,
Kansas City Corps of Engineers
700 Federal Building
601 East 12th Street
Kansas City, Missouri 64106

Department of the Army
Aviation and Missile Command
Building 3206 Redstone Arsenal
Huntsville, Alabama 35898

Submitted by:

Arrowhead Contracting, Inc.
12920 Metcalf Avenue, Suite 150
Overland Park, Kansas 66213

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List of Acronyms

ACI	Arrowhead Contracting, Inc.
ACM	asbestos-containing material
AMCOM	Aviation Missile Command
APR	air-purifying respirator
CENWK	U.S. Army Corps of Engineers, Kansas City District
CLP	Contract Laboratory Program
CO	carbon monoxide
CQAR	Chemical Quality Assurance Report
DQCR	Daily Quality Control Reports
DQO	data quality objective
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
FWV	Field Work Variance
FSP	Field Sampling Plan
GRO	gasoline range organics
HEPA	high-efficiency particulate air (filter)
IDW	investigation derived waste
MS	matrix spike
MSD	matrix spike duplicate
ND	non-detect
NIOSH	National Institute of Occupational Safety and Health
o.c.	on center
PACM	presumed asbestos-containing material
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
PPE	personal protective equipment
PRAC	Pre-Placed Remedial Action Contract
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QCSR	Quality Control Summary Report
QMP	Quality Management Plan
RAWP	Removal Action Work Plan
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SHERP	Safety, Health, and Emergency Response Plan

List of Acronyms (cont.)

SOP	standard operating procedure
SSHO	site safety and health officer
SLAAP	St. Louis Army Ammunition Plant
SVOCs	semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Potential
TSCA	Toxic Substances Control Act
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound

1.0 Introduction

This document constitutes the project report for the field investigation of polychlorinated biphenyl (PCB) contamination at Building 3 of the St. Louis Army Ammunition Plant (SLAAP) in St. Louis, Missouri (refer to Figure 1-1 for a site location map). On behalf of the U. S. Army Corps of Engineers (USACE), Kansas City District (CENWK) and the U.S. Army Aviation and Missile Command (AMCOM), Huntsville, Alabama, Arrowhead Contracting, Inc. (ACI) of Overland Park, Kansas conducted the work between June 18, 2001 and July 10, 2001 under Pre-Placed Remedial Action Contract (PRAC) No. DACW41-00-D0019, Task Order No. 0002.

The field investigation was conducted to determine the quantities of PCB contamination in and around Building 3 regulated pursuant to the Toxic Substance Control Act (TSCA). The data and other information collected during the field investigation will support the development of the Removal Action Work Plan (RAWP). The RAWP will detail the methods and procedures to be implemented at Building 3 during removal of concrete, soil, and other waste materials containing PCBs at concentrations exceeding 50 parts per million (ppm), the level above which disposal at a certified facility is required under TSCA. The results of this investigation will to be prepared by ACI. This report documents the field and analytical activities associated with the investigation and presents the results and findings of the investigation.

1.1 Project Objectives

This investigation was conducted to define the extent of PCB contamination within and around Building 3 as reported in the Comprehensive Environmental Baseline Survey Report (AMCOM, 2000). The investigation focused on areas of the building suspected of containing elevated PCB levels, including:

- Concrete flooring on the first floor, second floor, and basement
- Concrete flooring in the penthouses and former transformer rooms
- Soil flooring in the basement
- Soil outside the building, adjacent to the chip chute and chip chute loading area
- Waste material from the chip chute waste pile in the basement
- Waste material from the catch basin in the basement
- Concrete columns in the basement
- Concrete walls surrounding the chip chute waste pile

The initial selection of the suspected areas of PCB contamination was based on institutional knowledge and the results previous sampling efforts as described in detail in the *Alternative Evaluation for Removal of PCBs* (ACI, 2001a) and the *Field Sampling Plan* (FSP), Part I of the *Sampling and Analysis Plan* (SAP) (ACI, 2001b). The design of the overall sampling program for the investigation was based on the Data Quality Objectives (DQOs) process prescribed by the Environmental Protection Agency (EPA) in *Soil Screening Guidance: Technical Background Document* (EPA, 1996). The development of the DQOs for the Building 3 investigation was described in detail in the SAP. In summary, the objectives of the investigation were identified as follows:

- Define the area and volume of TSCA waste (PCB contamination at concentrations of 50 ppm or greater) present in concrete, soil, and waste material at Building 3.
- Determine the composition of the chip chute waste pile and material in the basement catch basin for evaluating disposal options during the removal action at Building 3.
- Determine the composition of building concrete, soil, and waste for evaluating waste disposal options during the removal action at Building 3.
- Assess the health and safety issues associated with exposure to building materials (i.e., dust generated from concrete-removal activities) during the removal action at Building 3.
- Verify that oil staining is a reliable indicator for identifying TSCA waste in basement soils.

Additional objectives for the investigation were identified in the *Quality Assurance Project Plan* (QAPP), Part II of the SAP (ACI, 2001b), as follows:

- Assess personnel exposure to silica from potential dust-generating activities during the Building 3 investigation.
- Characterize investigation-derived waste (IDW) (i.e., decontamination water and cooling fluids) from the investigation to determine proper disposal methods.

1.2 Report Organization

This report consists of the following five sections:

- Section 1 presents introductory information and outlines the objectives of the field investigation.

- Section 2.0 presents a discussion of the sampling activities, sampling methods, and other field activities associated with the collection of environmental samples.

- Section 3.0 presents a discussion of analytical activities and methods, including quality assurance/quality control (QA/QC) sampling and analytical data validation.

- Section 4.0 presents a discussion of the results and findings of the field investigation.

- Section 5.0 presents a list of applicable references.

2.0 Field Investigation Activities

This section includes discussions of the field investigation activities, including mobilization and sample layout, building contamination pre-inspection, field sampling, management and sampling of IDW, air sampling, sample labeling, equipment decontamination, field documentation and quality control, and health and safety. This section also includes a discussion of changes or modifications to planned field activities and/or procedures that resulted in variances to the SAP.

2.1 Mobilization and Layout

The field crew mobilized on June 17, 2001. On the morning of June 18, 2001, a health and safety orientation meeting was conducted with all members of the field crew. A government agency performed a security sweep of the building prior to entry by the field crew. Upon notice of security clearance, the field crew entered the building to begin the field work. The field crew performed a number of activities on June 18th, including:

- Unloading of field equipment and supplies
- Receipt and initial inspection of rental equipment (generators, ice machine, etc.)
- Set-up of field office
- Construction of drum containment area
- Operational check of air monitoring instruments
- Set-up of generators for electrical power
- Hook-up of power for pulverizer

The field crew established the sample processing area, which consisted of three primary stations:

- Concrete saw – tilesaw, cooling water bath, 55-gallon drum for decontamination water and cooling fluids
- Concrete pulverizer – pulverizer, 55-gallon drum for decontamination water
- Sample weighing and packaging area

The field office, sample processing area, and drum containment area were established in the southeast corner of Building 3, within the former garage and paint stripping area. Due the potential for particulate emissions and excessive noise, the saw cutting operation was established in the former paint stripping room to isolate it from other activities. The existing shelving within the paint stripping room was used for storage of supplies and samples. A refrigerator for sample archiving was also placed in the former paint stripping room.

Sample layout activities began on June 18. The locations for composite concrete floor samples on the first and second floors (refer to Section 2.3.1) were identified and marked on the floor. On June 19, 2001, sample layout activities resumed. Portions of carpet and underlayment were removed from the office area on the second floor to clear areas for concrete floor sampling. The field crew began the building contamination pre-inspection (refer to Section 2.2) and marked the locations of discrete concrete floor samples on the first and second floors. Additionally, the field crew staked out and/or marked the majority of locations for samples of soil flooring, concrete flooring, and concrete columns in the basement. Layout for the remaining sample locations (soil samples outside the building, additional soil samples in the basement, additional concrete column samples, concrete wall samples, and concrete floor samples in the penthouses) occurred at later dates during project.

The concrete coring crew mobilized, set-up equipment, and completed two test core holes on June 19. Using the test cores, the sampling crew practiced operating the tilesaw and pulverizer. Concrete floor sampling began on the morning of June 20, 2001.

2.2 Building Contamination Pre-Inspection

In accordance with the SAP, a pre-inspection of Building 3 was performed to identify miscellaneous oil-stained areas in the building that potentially indicated PCB contamination. The pre-inspection involved examining each floor of the building and recording the location of significant oil-stained areas on flooring and columns. The locations and dimensions of the stained areas were also sketched on a base map of the building. The miscellaneous oil-stained areas in the basement are depicted graphically in Figure 2-3. The table (insert) in Figure 2-3 presents a list of oil-stained concrete columns in the basement, including the approximate dimensions of the staining. The information obtained from the building contamination survey was used for the following purposes:

- On the first and second floors, observed oil-staining served as the basis for selecting miscellaneous areas outside the primary sampling grid (refer to Section 2.3.2) for discrete concrete floor sampling.
- In the penthouses (former motor rooms), the selection of concrete floor sample locations was based on the observation of oil-staining.

- In the basement, the selection of sample locations for soil flooring, concrete flooring, and building columns was based on the observation of oil-staining.

- To verify that oil-staining was a reliable indicator of PCB contamination in basement soils (refer to DQOs, Section 1.1), six soil samples in the basement were purposely located in areas where oil-staining was not observed.

During the building contamination pre-inspection, mapping of piping in the basement was also completed. Field personnel identified the major piping runs and measured the lengths of and diameters of the piping. The piping covered with asbestos-containing insulation was also noted. The piping and asbestos-containing material (ACM) locations and measurements were recorded on a base map of the building. This information is depicted graphically in Figure 4-1. A table contained in Figure 4-1 presents the linear footages and diameters of the piping and ACM.

2.3 PCB Sampling

Samples from Building 3 were collected to define the horizontal and vertical extent of PCB contamination from past operations. The areas of the building selected for PCB sampling were based on information from prior investigations combined with knowledge of the former locations of process equipment and operations. The sampling program included the collection of composite concrete floor samples, discrete concrete floor samples, soil samples in the basement, soil samples outside the building, waste samples from the chip chute waste pile and catch basin, and concrete column and wall samples. The general approach and methods for the collection of these samples are discussed in the following subsections. A summary of the overall PCB sampling program (including areas of concern, sample locations, sample IDs, and sample quantities) is presented in Table 2-1. Analytical and QA/QC sampling activities are discussed in Section 3.0.

2.3.1 Composite Concrete Floor Samples

The sampling areas on the first and second floors of Building 3 were classified as either process areas or traffic areas depending on the presumed origin of suspected PCB contamination. Process areas were suspected of PCB contamination due to leaks or spills from production operations and process equipment; whereas, traffic areas were aisles and other non-production areas suspected of PCB contamination due to the spread of PCB residues by foot-traffic and movement of equipment.

A sampling grid was established such that the flooring was subdivided into 20 foot (ft) X 20 ft sectors using the building columns as the four corners of each sector. As discussed in Section 2.8, the sector ID corresponded to the ID of building column in the northwest corner of the sector. To minimize the total number of samples required to characterize PCB contamination of the concrete flooring, a "checkerboard approach" was implemented according to the following protocol:

- Every other sector within the overall grid was sampled initially, such that each unsampled sector was adjacent to a minimum of two sampled sectors.
- An unsampled sector was assumed to be contaminated if the sampled sectors on opposite and adjacent sides were found to be contaminated (PCB concentration greater than action level; refer to Section 4.1).
- If the PCB results for the sampled sectors on opposite and adjacent sides of an unsampled sector did not correlate (i.e., one contaminated, the other uncontaminated), the outcome of the unsampled sector was determined to be inconclusive. Accordingly, the applicable sector was sampled to obtain an independent PCB result.
- If the corner sector of the sampling area was the unsampled sector, then the outcome was considered conclusive only if both adjacent sectors had the same outcomes.

Figures 2-1 and 2-2 depict the sampling grid on the first and second floors, respectively. Process areas are shown in blue; traffic areas are shown in red.

Composite floor samples consisted of concrete from up to four aliquots within a given sector. Each sector was subdivided into four equally-sized quadrants, where the center point of the quadrant represented the location of the aliquot sample. By convention, the quadrant/aliquot locations were identified as A, B, C, and D (refer to Section 2.8). Figure 1-2 presents an example schematic of the sample location nomenclature. The majority of composite samples consisted of concrete from each of the four quadrants within the sector. Seven composite samples consisted of less than four aliquots due to physical obstructions or other reasons as discussed in Section 2.11.

A concrete cap covered the majority of flooring on the first and second floors of Building 3. The cap was poured in 1992 following a prior remediation effort that involved scabbling the floors. [Additional details regarding the concrete cap are presented in Section 4.7.2.] As a means of penetrating the cap to sample the original flooring, concrete floor samples were collected using coring machines. The coring process provided a continuous core sample that facilitated the identification of the interface between the cap and original floor and the determination of the appropriate sample depth intervals below the scabbled surface of the original floor.

Two composite samples were collected from each sampled sector. One sample was collected from the upper one inch (in.) (0- 1 in.) of the original concrete flooring in both process and traffic areas. The second sample was collected from 1 – 2 in. below the original floor surface in traffic areas or 2 – 3 in. below the original floor surface in process areas. Composite concrete floor samples on the first and second floors of the building were collected as follows (assuming a sample comprised of four aliquots):

- At each aliquot location (quadrant), the concrete floor was cored to a maximum of 7 in. below the concrete cap using a Milwaukee coring machine with 1.5-in. (inner diameter) core sampler. The depth of seven inches below the cap was chosen as the optimum coring depth (for an assumed cap thickness of 4 in.) to ensure that the core penetrated deep enough below the original floor surface to obtain the required depth intervals for sampling. The coring depth was decreased in areas where the cap was believed to be less than 4 in. thick. In sectors where the cap was not present, cores were completed to a minimum depth of 2 in. below the floor surface. Once four aliquot samples (cores) for a given sector were completed, they were delivered to the saw cutting operation.

- Using a tilesaw, each concrete core aliquot was cut into individual 1-in. thick sections corresponding to the sample depth interval (0–1 in. and 1-2 in. in the former traffic areas; 0-1 in. and 2-3 in. in the former process areas).

- The individual 1-in. core sections were then pulverized using a BICO VP 1989 vibratory pulverizer. The concrete core section was placed into a steel grinding bowl along with a steel disc and steel ring. A lid was placed on the grinding bowl. The grinding bowl was placed into a fixture inside the top portion of the pulverizing unit. Once the grinding bowl was clamped in place and the top cabinet door of the pulverizing unit closed, the pulverizer was operated for a 30-second cycle. The cycle time was controlled by an automatic, digital timer. During the cycle, the bowl was vibrated/shaken at high speed, thereby mechanically pulverizing the concrete sample. This process reduced the concrete core sample to a powdered material of approximately 400 mesh.

- The pulverized material was then poured/scraped from the grinding bowl into a 4-ounce glass sample jar. The jar was labeled with the aliquot/quadrant ID (refer to Section 2.8).

- Once the four aliquots for a given sector and depth interval were processed, five grams of the powdered concrete from each jar were weighed on a laboratory-grade scale and combined in a 4-ounce glass jar for the composite sample. Thus, each composite sample jar contained 20-grams of concrete. The sample container was then labeled with the corresponding composite sample ID (refer to Section 2.8). [Note: The sample weight was adjusted accordingly for composite samples containing less than 4 aliquots and for those samples that required different analytical testing (refer to Sections 2.4 and 2.5).] The procedure for weighing out concrete for duplicate and split samples is discussed in Section 3.3.

- The composite sample was stirred and the jar was shaken to mix (homogenize) the concrete sample.

- The composite sample jar and the four aliquot sample jars were placed on ice or in a refrigerator to maintain the temperature at 4 °C prior to being packaged and shipped to the laboratory.

- Sampling equipment (coring bit, saw blade, grinding bowl, grinding accessories) was decontaminated between each sample as described in Section 2.9.

Each aliquot sample was containerized and submitted to the laboratory along with the composite samples. The laboratory was instructed to hold (archive) the aliquot samples pending the results of the corresponding composite sample. In accordance with the SAP, an individual aliquot sample was analyzed if the PCBs result for the corresponding composite sample was between 12.5 ppm and 50 ppm, indicating that the PCB concentration in one or more of the aliquots could potentially exceed the 50 ppm TSCA action level. The laboratory provided preliminary PCB results (subject to change) during the field investigation (refer to Section 3.4), which facilitated the selection of aliquots for analysis prior to receiving the final results. It should be noted that the aliquots from the deep interval (1 – 2 in. or 2 – 3 in.) were not analyzed if the PCB concentration from the 0 – 1 in. interval of the corresponding composite sample was already greater than 50 ppm, or if the PCB concentrations in the aliquots from the 0 – 1 in. interval were already less than 50 ppm. The aliquots from the deep interval were analyzed if the PCB concentration from the 0 – 1 in. interval of a composite sample was less than 12.5 ppm and the PCB concentration from the deep interval of the corresponding composite sample was between 12.5 ppm and 50 ppm.

The sample location IDs, depth intervals, and sample quantities for composite concrete floor samples are presented in Table 2-1. Overall, 386 primary composite samples were collected from 193 sectors (136 on the first floor and 57 on the second floor). Additionally, 331 concrete aliquot samples (refer to Table 2-2) were selected for analysis based on the result for the corresponding primary composite sample as discussed above. The results of composite concrete floor sampling on the first and second floors are discussed in Sections 4.1.1 and 4.1.2, respectively.

2.3.2 Discrete Concrete Floor Samples

The PCB sampling program also included the collection of discrete samples of concrete flooring. On the first and second floors, discrete samples were collected at the location where oil-staining was observed outside the primary sampling grid. Discrete samples were also collected from oil-stained concrete flooring in the basement and penthouses (near the former motors). The oil-stained areas were identified during the building contamination pre-inspection as discussed in Section 2.2. Additionally, one discrete concrete sample was collected from a concrete footing on the south perimeter of the chip chute waste pile area. All concrete floor samples, except the one in the chip chute area, were collected from 0 – 1 in. and 1 – 2 in. below the surface of the original flooring. The sample from the chip chute area was collected from 0 – 1 in.. On the first and second floors, discrete samples were collected as described in Section 2.3.1 for composite samples, except that the sample consisted of one concrete core (as opposed to cores from multiple aliquots). Discrete concrete floor samples in the basement and penthouses were collected as follows:

- Using a hammer drill, a hole was drilled at the sampling location to the specified depth.
- The powdered concrete (drill cuttings) generated by the drilling process were collected and placed into a 4-ounce glass jar. The sample container was labeled with the sample ID (refer to Section 2.8).
- The container was placed on ice or in a refrigerator to maintain the temperature at 4 ^{o}C prior to being packaged and shipped to the laboratory.
- Upon completion of the 0 – 1 in. interval for discrete floor samples, the drilled hole was cleaned out using a Shop-Vac prior to beginning the sample from the 1 – 2 in. interval.
- The drill bit was decontaminated between each sample as described in Section 2.9.

The sample location IDs, depth intervals, and sample quantities for discrete concrete floor samples are presented in Table 2-1. In total, 65 discrete concrete samples were collected from 33 locations as follows:

- First floor – 10 samples from 5 locations (Sectors A06, A12, E31, E33, and E37)
- Second floor – 4 samples from 2 location (Sectors A33 and K34)
- Basement – 43 samples from 22 locations (identified as CFB01 – CFB22)
- Penthouses – 8 samples from 4 locations within the penthouses (2 locations per penthouse; identified as CFP01 – CFP04)

The discrete floor sample locations on the first and second floors are shown in Figures 2-1 and 2-2. Discrete floor sample locations in the basement are shown on Figure 2-3. The results of discrete concrete floor sampling are discussed in Sections 4.1.1, 4.1.2, and 4.1.3.

2.3.3 Concrete Column and Wall Samples

During the building contamination pre-inspection, concrete columns in the basement were surveyed for oil-staining as possible evidence of PCB contamination. Oil staining was present on both the bases of the columns and the vertical portions of the columns above the base. A list of 44 oil-stained columns is presented in a table contained in Figure 2-3. Since there were more oil-stained columns identified during the building contamination pre-inspection than originally planned, samples were not collected from all of the oil-stained columns. Rather, PCB samples (identified as CC01 – CC22) were collected from 22 of the 44 oil-stained columns from either the column or base depending on where the most significant oil staining was observed. Furthermore, two samples (CW01 – CW06) were collected from oil-stained areas on each of the three walls in the chip chute area in the basement. Concrete column and wall samples were collected from 0 – 1 in. below the surface. The samples were collected using a hammer drill as described in Section 2.3.2. The sample location ID and sample quantities for column and wall samples are presented in Table 2-1. In total, 22 concrete column samples and 6 concrete wall samples were collected during the investigation. The sample locations are shown on Figure 2-3. The results of concrete column and wall sampling are discussed in Section 4.1.4.

2.3.4 Soil Samples in Basement

Soil samples were collected from oil-stained and non-oil-stained portions of soil flooring in the basement. In developing the sampling program for soil in the basement, it was presumed that oil-stained soil would be indicative of PCB contamination (if present). Accordingly, PCB soil samples were located in areas where oil-staining was observed during the building contamination pre-inspection (refer to Figure 2-3). To confirm the assumption that oil-staining is a reliable indicator of PCB contamination, six soil samples (identified as SS04, SS06, SS12, SS13, SS31, and SS34) were deliberately located in portions of the basement where no oil staining was observed. Additionally, two soil samples were located in the soil flooring below the chip chute waste pile (identified as SS47 and SS48). Except for the samples in the chip chute area, soil samples in the basement were collected from the 0 – 6 in. and 6 – 12 in. below ground surface (bgs) at each location. Soil samples from the chip chute area were collected from 0 – 6 in. and 12 – 18 in. below the base of the waste pile. The following general procedure was followed during the collection of soil samples in the basement:

- Soil borings were advanced to the bottom of the appropriate depth interval and collected using a stainless steel hand auger or a small barrel drive sampler.

- Soil from the appropriate depth interval was thoroughly mixed in a stainless steel bowl with a stainless steel spoon.

- After mixing, a sufficient quantity of soil was placed in a 4-ounce glass jar, and the container was labeled with the sample ID (refer to Section 2.8).

- The container was placed on ice or in a refrigerator to maintain the temperature at 4 °C prior to being packaged and shipped to the laboratory.

- Extra soil from the sample boring was returned to the borehole.

- Sampling equipment (hand auger, mixing bowl, mixing spoon) was decontaminated between each sample location and between each depth interval as described in Section 2.9.

The sample location IDs, depth intervals, and sample quantities for soil samples in the basement are presented in Table 2-1. Overall, 72 soil samples were collected from 36 locations as follows:

- Oil-stained soil flooring – 56 samples from 28 locations
- Non-oil-stained soil flooring – 12 samples from 6 locations
- Soil below the chip chute waste pile – 4 samples from 2 locations

The soil sample locations are shown on Figure 2-3. The results of soil sampling in the basement are discussed in Section 4.1.5.

2.3.5 Soil Samples Outside Building 3

In addition to the soils in the basement, the soil from an area outside Building 3 on the north side of the building adjacent to the chip chute was included in the investigation (refer to Figure 2-4). The presence of a loading dock, loading chutes, and two rail lines suggested in this area was a former load-out facility for waste materials from the chip chute. Consequently, soils in the area may have been impacted by the load-out operation. The initial sampling program for this area consisted of twelve sample locations (identified as SS35 through SS46 on Figure 2-4) in a staggered grid configuration (refer to Figure 2-4) as follows:

- One row with 6 sample locations (SS35 – SS40) adjacent to the building in front of the chip chute and loading dock
- A second row with 4 sample locations (SS41 – SS44) parallel to and 15 feet north of the first row
- Two sample locations (SS45 and SS46) in a third row parallel to and 15 feet north of the second row

Aside from a thin strip of soil immediately adjacent to the building, the majority of the sampling area was covered by approximately 4 inches of asphalt. Beneath the asphalt, a hard, thin layer of waste material (similar to the chip chute waste pile material) was observed, followed by 2 – 3 feet of gravel. Native soil was encountered beneath the gravel at average depth of 3 ft. bgs. Heavy staining with a strong petroleum odor was observed in the upper portions of the native soil at several of the sample locations. The presence of heavy contamination in soil samples from the outer perimeter of the initial sampling grid suggested that contamination extended further than the area encompassed by the grid. Therefore, five additional soil samples (refer to sample locations SS49 – SS53 on Figure 2-4) were placed around the limits of the initial sampling grid as shown in Figure 2-4. Furthermore, a relatively thin layer of water with a strong petroleum odor was detected at the gravel base at several sample locations. A water sample was collected from borehole at SS45 (refer to Section 2.4).

Soil samples for PCB analysis from the area outside Building 3 were collected from 0 – 6 in. bgs and from the upper portion of the native soil beneath the gravel bedding. Samples from the 0 – 6 in. interval contained the waste-like material found beneath the asphalt. The deeper interval within the native soil ranged from 30 in. to 42 in. bgs, with most of the samples obtained from the 36 – 42 in. depth interval. Due to the presence of a thick (approximately 16 in.) concrete driveway, a 0 – 6 in. sample was not possible at location SS52; therefore, only one sample was obtained from 33 – 36 in. bgs at this location. The soil samples outside Building 3 were collected in same manner as described in Section 2.3.4, with the following modifications:

- Utility clearances were obtained prior to commencing intrusive work. Missouri One-Call was notified. Various utility representatives performed inspections and verified that no critical utility lines were present within the limits of the sampling area.

- Where necessary, pavement was removed using a concrete saw and jackhammer. Gravel between the pavement and native soil was removed using a post-hole digger and shovel.

- Soil borings beneath the pavement were advanced to the bottom of the appropriate depth interval with the assistance of a powered auger and collected with a hand auger, small barrel drive sampler, or trowel.

The sample location IDs (refer to Section 2.8), depth intervals, and sample quantities for the soil samples outside Building 3 are presented in Table 2-1. In total, 33 soil samples were collected from 17 locations. The results of the soil sampling outside Building 3 are discussed in Section 4.1.6.

2.3.6 Waste Pile and Catch Basin Samples

Samples of waste material were collected from the chip chute waste pile and from the interior of the catch basin in the basement. [Note: The catch basin is a concrete trough (approximately 5 ft. x 15 ft. x 3 ft.) located 140 ft west of the chip chute along the north wall of the basement.] Three representative samples (identified as WP01 – WP03) were collected from the chip chute waste pile. The samples were comprised of material from the surface of the pile to the flooring below the pile (i.e., one depth interval). Thus, the depth at each sample location varied depending on the height of the waste pile and ranged from 4 – 18 inches. The depth of material in the catch basin was also found to be variable, ranging from 10 - 14 in. Samples of waste material were collected at two locations (identified as CB01 and CB02) from an upper and lower depth interval at each location. The upper depth interval was approximately 0 – 6 in.; the lower depth interval was approximately 6 in. to the bottom of the basin. The following general procedure was used to collect waste samples:

- Sample borings were advanced to bottom of the catch basin or waste pile with a stainless steel bucket auger. Samples were collected using the bucket auger and/or a shovel.

- Waste material from the selected intervals was thoroughly mixed in a stainless-steel bowl with a stainless-steel spoon.

- After mixing, a sufficient quantity of waste material was placed in a 4-ounce glass jar, and the container was labeled with the sample ID (refer to Section 2.8).

- The container was placed on ice or in a refrigerator to maintain the temperature at 4 °C prior to being packaged and shipped to the laboratory.

- Extra material from the sample boring was returned to the basin or waste pile.

- Sampling equipment (hand auger, shovel, mixing bowl, mixing spoon) was decontaminated between each sample location and between each depth interval (for catch basin samples) as described in Section 2.9.

The sample location IDs, depth intervals, and sample quantities for waste samples are presented in Table 2-1. In total, 3 waste samples were collected from three locations in the chip chute waste pile; 4 samples were collected from 2 locations in the catch basin. The results of waste sampling are discussed in Section 4.1.7.

2.4 Removal Action Waste Pre-Determination Sampling

Based on the results of PCB sampling discussed in Section 2.3, areas of Building 3 materials (concrete, soil, and waste materials) containing PCBs at concentrations greater than 50 ppm will be removed and disposed during a future removal action. Consequently, the material requiring disposal must be profiled such that compliance with waste acceptance criteria can be documented. Waste materials must be properly classified in accordance with applicable disposal standards, including TSCA and the Resource Conservation and Recovery Act (RCRA). The determination of TSCA wastes was accomplished through the PCB sampling discussed in Section 2.3. To preliminarily determine whether any Building 3 materials will also be classified as a RCRA hazardous waste, samples were collected for analysis of semi-volatile organic compounds (SVOCs) and metals per the Toxicity Characteristic Leaching Procedures (TCLP). Samples were also collected to evaluate the petroleum content of Building 3 materials through analysis of gasoline range organics (GRO), diesel range organics (DRO). Removal action waste pre-determination sampling involved the collection of representative samples from the media and areas of the building that are likely to be removed and disposed during the removal action (i.e., materials containing PCBs greater than 50 ppm). The program included the following samples (refer to Table 2-3):

- One sample of concrete flooring was collected from Sector CF1C23 where PCB contamination was known to exceed 50 ppm based on preliminary results. The sample was comprised of concrete obtained from multiple cores from the 0 – 1 in. interval within the sector.

- One sample of soil flooring in the basement was collected from location SS23 where significant oil staining was observed and was suspected of containing elevated levels of PCBs. The sample was comprised of soil from 0 – 18 in. bgs.

- One sample of soil was collected from SS43 in the area outside Building 3 adjacent to the chip chute and loading dock. The sample was comprised of soil from 0 – 6 in. and 36 – 42 in. bgs.

- One sample (WP02) was collected from the chip chute waste pile. The sample was comprised of waste material from the surface to the bottom of the waste pile.

- One sample (CB02) was collected from the catch basin. The sample was comprised of waste material from the surface of the waste material to the bottom of the catch basin.

The samples referenced above were analyzed for TCLP SVOCs, TCLP Metals, and GRO/DRO. To further characterize the heavy petroleum staining in soils outside Building 3 (refer to Section 2.3.5), the following samples, not originally planned per the SAP, were collected in accordance with a field work variance (refer to Section 2.11).

- One additional sample of stained soil from SS40 (36 – 40 in. bgs) was collected and analyzed for GRO/DRO.

- One sample of groundwater from SS45 was collected and analyzed for GRO/DRO and volatile organic compounds (VOCs).

With the exception of different sample volumes and container requirements, removal action waste pre-determination samples were collected using the same procedure described in Section 2.3. The results of removal action waste pre-determination sampling are discussed in Section 4.3.

2.5 Health and Safety Pre-Assessment Sampling

Future removal action and demolition activities at Building 3 may include saw cutting, jack hammering, and other construction-related, intrusive operations that will likely generate significant quantities of dust and debris. In addition, removal action and demolition workers will likely come into contact with bulk waste materials. As a means of pre-assessing the potential health and safety concerns associated with exposure to site contaminants, samples were collected and analyzed to evaluate contaminants (in addition to PCBs) that may be present in dust and debris. Potential contaminants include various SVOCs and heavy metals. The collection and analysis of PCB samples as discussed in Section 2.3 were adequate for assessing exposure to PCBs. Thus, health and safety pre-assessment samples were collected for analysis of Total SVOCs and Total Metals. Health and safety pre-assessment sampling involved the collection of representative samples from the media and areas of the Building that are likely to be disturbed during removal action and demolition activities. The sampling program included the following samples (refer to Table 2-4):

- Three sample of concrete flooring were collected from Sectors CF1C23, CF1D24, and CF1E23 where PCB concentrations were known to exceed 50 ppm based on preliminary results. Samples were comprised of concrete obtained from multiple cores from the 0 – 1 in. interval within each sector.

- One sample of soil flooring in the basement was collected from a location SS23 where significant oil staining was observed and was suspected of containing elevated levels of PCBs. The sample was comprised of soil from the 0 – 18 in. bgs.

- One sample of soil was collected from SS43 in the area outside Building 3 adjacent to the chip chute and loading dock. The sample was comprised of material from the 0 – 6 in. and 36 – 42 in. bgs.

- One sample was collected from the chip chute waste pile (WP02). The sample was comprised of waste material from the surface to the bottom of the waste pile.

- One sample was collected from the catch basin (CB01). The sample was comprised of waste material from the surface of the waste material to the bottom of the catch basin.

- To collect preliminary information for areas/media to be removed during a future demolition, representative samples were collected from materials not anticipated to be contaminated with PCBs above the TSCA action level. Samples of concrete were collected from Sectors CF1D40 and CF2C25 located outside the PCB sampling grid. A soil sample from location SS34, located in a non-oil-stained area of the basement.

With the exception of different sample volume and container requirements, health and safety pre-assessment samples were collected using the same procedures described in Section 2.3. The results of health and safety pre-assessment sampling are discussed in Section 4.4.

2.6 *IDW Management and Sampling*

Liquid IDW generated during the investigation included cooling water from concrete coring operations, water from the decontamination of coring/sampling equipment, and water from the decontamination of sample processing equipment (tilesaw, grinding bowls, etc). Each of these liquid streams potentially contained PCBs and other contaminants from direct contact with samples and equipment. [Note: Cooling water was circulated through the bit during coring and made contact with the concrete floor materials.] There was also a potential that decontamination fluids also contained low levels of heptane from decontaminating the sampling equipment (refer to Section 2.9). Furthermore, absorbent mats and booms were used during coring operations to contain the cooling water discharge from the coring machines. Since the absorbents became saturated with cooling water, they were handled as IDW.

All IDW was containerized in steel, open-top or closed-top, 55-gallon drums. Cooling water and decontamination water were combined in the field for convenience. Drums of IDW were placed in the drum containment area. The drum containment area consisted of a polyethylene-lined flooring surrounded by a continuous absorbent boom for secondary containment. In total, 29 drums of IDW were generated during the investigation resulting in the following quantities (refer to Table 2-5):

- Water from coring operations (cooling water and decontamination water), with minor amounts of decontamination water from other sampling operations – 15 drums, approximately 750 gallons
- Water from decontamination of concrete sample processing equipment – 9 drums, approximately 450 gallons
- Absorbents – 5 drums, approximately 2,500 pounds

IDW was sampled to assess the options for disposal. Rather than sample the IDW for a full-range of analytes and tests, the analytes were selected based on knowledge of the processes that generated the wastes. Contaminants reasonably anticipated to be present in the IDW included PCBs, SVOCs, metals, and heptane. The following IDW composite samples were collected:

- Two composite samples (identified as IDW01 and IDW02) of the water generated from concrete coring operations were collected. Each sample was comprised of aliquots from four separate drums. The samples contained the liquid portion of the IDW and the concrete sediment that had accumulated at the bottom of the drums. The samples were submitted for analysis of PCBs, Total SVOCs, Total Metals, and heptane.

- Two composite samples (identified as IDW03 and IDW04) of the water generated from the decontamination of sample processing equipment were collected. Each sample was comprised of aliquots from three separate drums. The samples contained the liquid portion of the IDW and the concrete sediment that had accumulated at the bottom of the drums. The samples were submitted for analysis of PCBs, Total SVOCs, Total Metals, and heptane.

- One composite sample of the absorbents (IDW05) was collected and analyzed for PCBs, TCLP SVOCs, and TCLP Metals. The sample was comprised of absorbent material from two of drums.

- Two additional composite samples (identified as IDW06 and IDW07) of IDW water were collected on September 6, 2001, after the investigation was completed. Each sample was comprised of aliquots from two drums. The samples consisted of the liquid portion of the IDW, but did contain any of the concrete sediment that had accumulated at the bottom of the drums (refer to Section 4.5). The samples were submitted for analysis of Total Metals.

IDW water samples were collected using a Teflon bailer. Sample containers were filled by pouring directly from the bailer. Absorbent samples were obtained by cutting small pieces of the various absorbents (booms and mats) with scissors. The absorbent pieces from each drum were mixed by hand prior to being placed in the sample containers. The results of IDW sampling are discussed in Section 4.5.

2.7 Air Sampling

Air samples were collected during the investigation to evaluate the potential for exposure to concrete dust and silica contained in the dust. The air sampling program was designed to obtain at least one air sample from the field operations with the highest potential for emitting concrete dust. These operations included:

- Concrete saw cutting
- Concrete pulverizing
- Concrete coring
- Concrete drilling

- Weighing and packaging concrete samples

A summary of the air sampling program is presented in Table 2-6. Each air sample was analyzed for respirable dust and crystalline silica per National Institute of Occupational Safety and Health (NIOSH) Methods 0600 and 7500, respectively.

Two types of air samples were collected. "Area" samples were collected from a fixed location near the operation using a high-volume sampling pump. "Personal" samples were collected from the breathing zone of a member of the field crew using a low-volume sampling pump. For personal samples, the sample pump and sample cassette were attached to a field crew member performing the operation. Air samples were collected according to the following general procedure:

- Components of the air sampling system included a 5-micron PVC filter (sample) cassette, 10 mm nylon cyclone assembly (to separate respirable dust from non-respirable dust), and sampling pumps (low-volume sampling pump and high-volume diaphragm sampling pump).

- The cyclone assembly was attached to the inlet of the sampling pump via vinyl tubing. The sample cassette was then attached to the cyclone assembly.

- The sampling pump was turned on, and the initial flow rate was checked using a rotameter.

- The flow rate was then adjusted to the desired sampling flow rate. The flow rate was based on the required sample volume and the estimated total time the sample would be collected.

- After noting the specific start time, the air sampling system was operated continuously over a time period sufficient for collecting the required air volume and adequately characterizing dust emissions from the operation of interest.

- Once the sample was completed, the specific finish time was noted, and the sampling pump was turned off. The final flow rate was checked using a rotameter.

- The sample cassette was then removed from the cyclone assembly and capped at both ends (inlet and outlet).

- The sample cassette was labeled with the sample ID (refer to Section 2.8) and packaged for shipment to the laboratory. An air monitoring field sheet was completed and attached to the chain-of-custody.

The following parameters were documented on the air monitoring field sheet: sample ID, total sample time (in minutes, based on start and finish times), average flow rate (in liters per minute, based on initial and final flow rates), and total volume (flow rate x total time). The results of air sampling are discussed in Section 4.6.

2.8 Sample Labeling and Identification

Each type of sample collected during the investigation was identified by a two- or three-character prefix as follows:

- CF1 – concrete floor sample, first floor
- CF2 – concrete floor sample, second floor
- CFB – concrete floor sample, basement
- CFP – concrete floor sample, penthouse
- CW – concrete wall sample
- CC – concrete column sample
- SS – soil sample
- WP – waste pile sample
- CB – catch basin sample

For concrete floor samples (CF1 and CF2), the prefix was followed by the sector identifier, which consisted of a reference to the row and column designations within the building (refer to Figure 1-2). As an example, "D24" represented the 20 ft x 20 ft sector where the building column in the northwest corner was located in Row D, Column 24. Accordingly, "CF1D24" represented the location of the concrete floor sample on the first floor in Sector D24. The aliquots from each sector were designated with the letters A, B, C, or D depending on which quadrant the aliquot sample was collected (refer to Figure 1-2). By convention, quadrant "A" was the northwest quadrant within the sector. The remaining quadrants, "B", "C", and "D", were designated in counter clockwise fashion from quadrant "A". For example, "CF1D24A" indicated the aliquot sample from quadrant A of Sector D24. Lastly, the sample ID for concrete floor samples from the first and second floors ended with a two-digit number representing the sample depth interval: "01" for 0 – 1 in., "12" for 1 – 2 in., and "23" for 2 – 3 in.. Consequently, "CF1D2423" represents a concrete floor sample, collected from the first floor from the Sector D24 at a depth interval between 2 and 3 inches below the original floor surface.

For all remaining samples (other than IDW and air samples), the prefix was followed by the sample location ID and then the depth interval. The location IDs started with "01" for the first sample of a given type and ended with the highest two-digit number necessary. For example, the 53 soil sample locations for the investigation began with location SS01 and ended with location SS53. The depth interval was represented by a four-digit number – i.e., "0006" for 0 – 6 in., "3642" for 36 – 42 in., etc.

Investigation-derived waste sample IDs consisted of the prefix "IDW" followed by "01" through "05" representing the five samples that were collected. Air sample IDs consisted of the pre-fix "PERS" (personal samples) or "AREA" (area samples) followed by a six-digit number for the date the sample was collected.

The protocol for sample IDs associated with QA/QC samples are discussed in Section 3.3.

2.9 Equipment Decontamination

Sample equipment was decontaminated in general accordance with the SAP (ACE, 2001b). For composite concrete floor samples, coring bits were decontaminated between each quadrant (aliquot) and sector. The tilesaw was decontaminated between each concrete core aliquot. The pulverizer grinding bowl and accessories were decontaminated between each 1-in. aliquot core section. For discrete floor samples, soil samples, and waste samples, sampling equipment was decontaminated between each sample location and depth interval. The decontamination procedure included the following steps:

- Washing and scrubbing with Alconox soap and water
- Application of analytical grade heptane
- Final rinse with deionized water

Heptane was chosen as an effective solvent for removing residual PCBs from the surface of sampling equipment. Heptane was sprayed onto the equipment using a spray bottle. The final rinse with deionized water was also applied with spray bottle. Decontamination fluids were containerized in 55-gallon drums and managed as IDW as described in Section 2.6.

2.10 Field Documentation and Quality Control

The primary means of field documentation included sample collection field sheets and the Daily Quality Control Report (DQCR). Sample collection field sheets were completed by sampling technicians for each sample. Information recorded on the field sheets included, at a minimum, sample IDs, QA/QC sample IDs (if applicable), time and date of sample collection, sample collection methods, name(s) of sample technician(s), sample depth intervals, types of sample containers, and analytical parameters and methods. As necessary, diagrams and other pertinent notes were included on the sample collection field sheets. The complete set of field sheets for the investigation will be submitted under separate cover. Additionally, the QA/QC Manager or Site Supervisor completed a DQCR that summarized the day's field activities. The DQCR included the number and types of samples collected, preliminary PCB analytical results (if available), a list of equipment on site, health and safety activities, and other significant findings or events. DQCRs were submitted to the USACE oversight manager each day (for the previous day's activities) during the project.

The QA/QC Manager and/or Site Supervisor completed daily QC inspections. The QC inspections were documented on activity-specific (i.e., composite floor sampling, soil sampling) QC checklists. The QC inspections were designed to ensure that field activities were performed in accordance with project specifications (FSP and QAPP) and accepted field practices. Inspection items included, at a minimum, the proper location of samples, use of specified equipment and methods, proper decontamination procedures, use of the required sample containers, and proper sample packaging and chain-of-custody protocols. Completed QC checklists were included with the DQCR. The QA/QC Manager also maintained a log of samples collected. The log served as means for tracking samples to ensure that QA/QC samples (refer to Section 3.3) were collected at the proper frequencies. Furthermore, the QA/QC Manager also recorded some pertinent information in a field logbook; however, field sheets and the DQCR were used as the primary sources for field documentation and QC.

2.11 Field Work Variances

Field work associated with the investigation was performed in general accordance with the SAP (ACI, 2001b). However, during the course of field activities, unanticipated field conditions were encountered, or improved methods/procedures were identified. This resulted in several changes or modifications to planned field procedures. The most significant changes to the SAP were documented as field work variances (FWVs). Seven FWVs were prepared and submitted to USACE for review and approval. These FWVs are summarized in the following table.

FWV No.	Description	Cost/Schedule Impact
FWV-01	Analytical grade heptane was used instead of methanol for equipment decontamination.	None. Costs for both chemicals approximately the same.
FWV-02	In the area west of Row 9 on the first floor, a layer of concrete (other than the cap) of unknown origin was found overlying the original floor. Composite samples from this area were comprised of concrete from the upper one inch of the unknown layer and the original floor.	None. No additional samples required.
FWV-03	Discrete samples from building columns were collected from either the vertical portion of the column or the base of the column, depending on the location where the most significant oil staining was observed.	None. No additional samples required.
FWV-04	Waste material in the catch basin was shallower than anticipated. Accordingly, the samples for removal action waste pre-determination and health and safety pre-assessment from the catch basin were collected from one continuous interval (surface to the bottom of the basin), rather than from an upper and lower depth interval.	Cost savings due to a decrease in the number of samples from the catch basin.
FWV-05	All concrete aliquot samples were submitted to the laboratory for archiving in lieu of archiving them on-site. In doing so, the laboratory could retrieve specific aliquot samples for analysis immediately upon notification, rather than waiting an additional day for the samples to be shipped from the site. This approach minimized potential for exceeding 14-day holding time.	Cost increase due to an increase in shipping costs; however, cost savings from ensuring standard turnaround times instead of accelerated turnaround.
FWV-06	The soil sampling grid outside Building 3 was modified to include more samples closer to the building. The grid consisted of three rows spaced 15 ft apart with six samples in the first row (adjacent to the building), four samples in the second row, and two samples in the third row. It was also necessary to remove pavement in this area to collect samples from the underlying soil.	Cost increase due to rental of equipment to remove pavement.

FWV No.	Description	Cost/Schedule Impact
FWV-07	Additional soil samples were collected outside Building 3 to investigate the extent of heavy petroleum staining. One soil sample was collected and analyzed for GRO/DRO. One water sample was collected for GRO/DRO and VOC analysis.	Cost increase due to additional samples and analyses.

There were several minor modifications or clarifications to the SAP that were implemented or observed in the field but were not incorporated as FWVs:

- The transformer vaults in the basement (as identified on Figure 3-1 of the FSP) were not present. Accordingly, discrete concrete floor samples originally planned for the transformer vaults were not collected.

- The following sectors (as identified on Figures 3-2 and 3-3 of the FSP) did not exist: CF1A11, CF1A27, and CF2A17. That is, there was no flooring present at these locations.

- Sectors CF1A21, CF1K28, and CF2A21 were stairwells. Composite floor samples were collected from the flooring not occupied by stairs, which resulted in two aliquots per composite sample.

- Composite floor samples from CF1H29 and CF1F29 consisted of concrete from the two aliquots located within the former drum storage area. The two other aliquots were not collected because they were located outside the limits of the former drum storage area.

- Half of sector CF1G33 was occupied by a walkway separated from the production floor. Thus, the composite sample was comprised of the two aliquots not located in the walkway.

- One of the quadrants from CF1B04 was occupied by a steel grate. Therefore, the composite sample contained concrete from three non-obstructed aliquots.

- The composite sample from CF2F11 consisted of aliquots from the A, C, and D quadrants. The B quadrant was obstructed by a wall.

2.12 Health and Safety

Health and safety activities for the investigation were performed in general accordance with the *Safety, Health, and Emergency Response Plan* (SHERP) (ACI, 2001c). A tailgate safety meeting was conducted by the Site Safety and Health Officer (SSHO) for all field personnel at the beginning of each day. During the meeting, the major health and safety issues associated with the planned field work were discussed. Typical issues discussed during the meeting included heat stress, slips/trips/falls, noise hazards, machinery point-of-operation hazards, dust generation, and carbon monoxide (CO) emissions from generators.

Personal protective equipment (PPE) was generally specified for Level D or modified Level D. However, due to concerns for concrete dust exposure, the concrete drilling operations (refer to Section 2.3.2) were performed in Level C, including the use a half-face air-purifying respirator (APR) with high-efficiency particulate air (HEPA) filters. Hearing protection was required at all times for personnel involved in concrete coring, concrete drilling, and saw cutting. Boot covers were worn in the basement to prevent contact with contaminated soil.

Air monitoring was performed each day of the project to test work environments for various contaminants. Dust (particulate) levels were checked each day using a PDR1000 particulate monitor. Carbon monoxide was a concern due to exhaust emissions from the generators; CO was monitored with a MiniCO responder. Organics vapors were checked with a 580B photoionization detector (PID). A Passport 4-gas monitor was used to test the atmosphere in the basement for oxygen content, combustible gases, CO, and toxic vapors prior to entry and periodically during field work activities. Furthermore, noise (decibel) levels were monitored with a Quest 2800 sound level meter. Adjustments to field methods or PPE levels were made accordingly when the readings exceeded action levels. For example, elevated levels of CO were detected when generators were operated inside the building or outside the building near open doorways. As a result of these readings, all generators were restricted to the outside of the building away from doorways.

The SSHO performed a daily inspection of safety equipment and procedures. The inspections were documented via a safety checklist, which was included with the DQCR (refer to Section 2.10). Field equipment was inspected each day by the SSHO to check for proper maintenance and safe operation, including the presence of safety guards. A checklist was completed for each machine to document the inspection. These checklists were also included with the DQCR. Other documentation related to health and safety included: daily safety meeting record, air monitoring log, daily hot work permit for generators, SHERP compliance agreement forms, and training verification forms.

3.0 Analytical and QA/QC Activities

This section includes discussions of the analytical methods, sample packaging/shipping/receipt, QA/QC sampling and analysis, data reporting and data validation.

3.1 Sample Analysis

Sample analysis was performed in general accordance with the QAPP. All primary samples were submitted to the subcontractor laboratory (Analytical Management Laboratories of Olathe, Kansas) for chemical analysis. Analytical Management Laboratories was certified by the USACE Center of Expertise. As required, the laboratory standard operating procedures (SOPs) were prepared in accordance with *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846* (EPA, 1992). The SOPs were submitted to USACE for review and approval prior to start of the investigation. Samples were prepared/extracted and analyzed using the following EPA SW-846 methods:

Preparation/Extraction	Analysis
• Methods 3540C or 3541 – Soxlet extraction (solids) • Method 3510C – Separatory funnel extraction (liquids) • Method 3050B – Acid digestion (solids) • Method 3010A – Acid digestion (liquids) • Method 5035 – Purge and trap extraction (solids) • Methods 1311and 3580A – TCLP preparation	• Methods 8082 – PCBs • Method 8270C – SVOCs • Method 6010B – Metals, except mercury • Methods 7470A/6010B and 7471A/6010B – Mercury • Method 8015B Modified (M) – GRO/DRO • Method 8260B – Volatile Organic Compounds (VOCs)

3.2 Sample Packaging, Shipping, and Receipt

Samples were packaged in coolers provided by the laboratory in accordance with criteria outlined in the FSP. All samples were packaged in manner that prevented damage during shipment and were surrounded by Ziploc® bags containing ice to maintain the temperature at 4 °C for shipment to the laboratory. The applicable chains-of-custody accompanied each group of coolers to be shipped. Samples were shipped to the laboratory by Federal Express (priority overnight). The laboratory was contacted by the QA/QC Manager each day to verify the receipt of samples shipped out on the previous day. The laboratory assigned internal tracking (LIMS) numbers to the samples upon receipt, including the aliquot samples for archiving (refer to Section 2.3.1). The Laboratory Project Manager submitted a list of the tracking numbers and corresponding sample IDs to the Site Supervisor for each day that samples were received.

3.3 QA/QC Sampling and Analysis

The QA/QC program included the collection and analysis of the following samples:

- Field duplicates
- Split samples
- Equipment rinsates
- Matrix spike/matrix spike duplicates (MS/MSDs)

Field duplicate and split samples were collected at a frequency of 10% of the primary PCB samples. MS/MSD samples and equipment rinsates were collected at a frequency of 5% of the primary PCB samples. Duplicates, MS/MSDs, and rinsates were submitted to the subcontractor laboratory for analysis. Split samples were submitted to the USACE quality assurance laboratory in Omaha, Nebraska. QA/QC samples were submitted for analysis along with the primary samples. In total, 119 QA/QC samples were collected during the investigation - 58 duplicate/split samples, 31 matrix spike/matrix spike duplicate (MS/MSD) samples, and 30 equipment rinsates (refer to Table 2-1).

Duplicates and splits of composite and discrete concrete floor samples (first and second floors) were prepared as follows (refer to Section 2.3.1):

- Instead of weighing out 5 grams of material from of the four aliquots as discussed in Section 2.3.1, 15 grams of concrete from each aliquot were combined in single 4-ounce glass jar.

- The jar containing 60-grams of concrete was stirred and then shaken to composite/mix the concrete sample.

- After mixing, 20 grams of the composited concrete was weighed and placed into a new 4-ounce glass jar for the duplicate sample. Another 20 grams of the concrete was weighed and placed into a glass jar designated for the split sample. The remaining 20 grams of concrete became the primary composite sample.

Duplicates and splits of discrete concrete floor samples in the basement and penthouses and concrete column and wall samples were prepared as follows (refer to Section 2.3.2):

- A sufficient quantity of concrete was collected during drilling to fill a 4-ounce glass jar to near-capacity. (Based on field experience, the volume and mass collected was sufficient for the primary, duplicate, and split samples.)
- The sample jar was shaken vigorously to mix/homogenize the concrete.
- Two additional samples jars (one for the duplicate sample, one for the split sample) were partially filled with concrete from the original sample jar, such that each of the three jars contained approximately the same amount of concrete. The concrete remaining in the original jar became the primary composite sample.

Duplicates and splits for soil and waste samples were taken from the mixing bowl after the material was homogenized as described in Section 2.3.4.

Duplicate sample IDs consisted of the primary sample ID (refer to Section 2.8) with a factor of "500" added after the prefix. In doing so, the sample became a "blind" duplicate that was unrecognizable to the subcontractor laboratory. For example, the duplicate sample ID for primary sample CF1C2301 was CF1C52301. For split samples submitted to the USACE quality assurance laboratory, the sample ID contained a "D" added to the end of the primary sample ID. For example, the split sample associated with primary sample CF1C2301 was CF1C2301D.

MS/MSD samples were collected in the field to provide a sufficient volume of site-specific media to the laboratory for performing MS/MSD analysis. As discussed in the QAPP, MS/MSDs were analyzed as part of the laboratory QC program to assess the effects, if any, of sample matrix on the outcome of the analyses (measured as percent recovery of the chemical compound(s) used to spike the sample). MS/MSD recoveries for samples spiked with PCBs at 50 ppm (the TSCA action level) were used to evaluate the potential for false negative results as discussed in Section 4.1.8. MS/MSD samples were collected in the same manner as duplicate/split samples as discussed above. MS/MSD sample IDs consisted of the primary sample ID plus "MS" or "MSD". The results of MS/MSD analyses for samples spiked at 50 ppm are discussed in Section 4.1.8, with further details provided in the Quality Control Summary Report (QCSR) (refer to Section 3.5).

Equipment rinsates were collected to assess the effectiveness of decontamination procedures. Rinsates were collected from the sampling equipment that potentially contacted site contaminants, including the pulverizer grinding bowl, coring bits, tilesaw blade, bucket auger, and shovel. Rinsate samples were collected immediately following decontamination of the equipment used to collect the primary sample. Deionized/distilled water was poured over/through the equipment and collected in the appropriate sample containers. Rinsate sample IDs consisted of the primary sample ID plus "R".

3.4 Data Reporting

Preliminary results for composite concrete floor samples were provided by the laboratory as soon as available – typically within 3 to 5 days. Many of the preliminary results were estimated (projected) values for samples in which the PCB concentration exceeded the calibration range of the analytical instrument. These samples were eventually diluted and reanalyzed to determine the final result. Therefore, preliminary results were subject to change. Notwithstanding, the results were used in the field to select individual aliquot samples for PCB analysis. As discussed in Section 2.3.1, individual aliquots from a given sector and depth were analyzed if the result from the corresponding composite sample was between 12.5 ppm and 50 ppm. The preliminary results provided by the laboratory facilitated the timely identification of aliquots for analysis, thereby minimizing the possibility of exceeding the 14-day holding time for PCBs. To further ensure compliance with holding times, the laboratory performed the Soxlet extraction for all aliquot samples prior to expiration of the 14-day holding time.

Final sample results were submitted in Contract Laboratory Program (CLP) Level III format as required, including a case narrative, sample results, and laboratory QA/QC results (i.e., method blanks, laboratory control samples, system monitoring compounds, and matrix spikes). The data packages typically contained the results for up to 20 samples from a single analytical batch; although, some data included samples from multiple batches. The Level III data packages were received after the field work was completed. As anticipated, the final and preliminary results were different for many samples (see above). In some cases, the final PCB concentration was between 12.5 ppm and 50 ppm, despite the initial (undiluted) results being less than 12.5 ppm. This resulted in the analysis of individual aliquot samples after the field investigation had concluded. All final results from the investigation were entered into a Microsoft Excel spreadsheet for data analysis and reporting.

3.5 Data Review and Validation

In accordance with the QAPP, a certified chemist performed a Level III review of 100% of the data from the investigation. In addition, a Level IV validation was performed for 10% of the analytical data (approximately 100 results). For the Level IV validation, five data batches of approximately 20 samples per batch were chosen. One batch was randomly selected from each of the following five categories:

- Concrete samples with generally high PCB concentrations (> 50 ppm)
- Concrete samples with generally intermediate PCB concentrations (12.5 ppm – 50 ppm)
- Concrete samples with generally low PCB concentrations (<12.5 ppm)
- Soil samples with a range of PCB concentrations
- Soil and concrete samples analyzed for SVOCs, Metals, and GRO/DRO

These categories were considered representative of the types of media, analytical parameters, and range of contaminant concentrations. The results of the Level III review and Level IV data validation are presented in the QCSR. The QCSR will be submitted to USACE under separate cover.

A copy of the Level III data packages were submitted to the USACE laboratory in Omaha. USACE chemists will evaluate the comparability of the split sample results (refer to Section 3.3) to the results of duplicates and the corresponding primary samples. A Chemical Quality Assurance Report (CQAR) will then be prepared discussing the results of this evaluation. It is anticipated that the CQAR will be submitted under separate cover at a later date.

4.0 Results and Findings

This section presents the results and findings of the field investigation, including an assessment of PCB contamination, an estimate of the quantities of TSCA waste, the results of removal action waste pre-determination sampling and health and safety pre-assessment sampling, and other findings in support of the removal action.

4.1 PCB Contamination Assessment

The areas of PCB contamination in Building 3 were identified through the collection of concrete, soil, and waste material samples as described in Section 2.3. The results of the PCB investigation are presented below by area/media of concern. In addition, this subsection presents the results of sampling conducted to determine whether oil-staining was a reliable indicator of PCB contamination in soil, an evaluation of MS/MSD recoveries, the results of QA/QC sampling, and an analysis of data gaps.

NOTE: The regulatory level at which a material must be disposed as a TSCA waste is 50 ppm (refer to Section 1.0). Due to the uncertainty with regard to the analytical method for PCBs (refer to Section 4.1.8), TSCA waste materials with actual concentrations near or slightly above 50 ppm could potentially be misidentified as non-TSCA waste. This could occur if the recovery of PCBs during analysis was less than 100%. To minimize the potential for false negatives and increase the certainty that Building 3 materials exceeding 50 ppm are identified, a modified action level was established using the lowest achieved MS/MSD recovery (87%) for site samples spiked with 50 ppm of Aroclor 1248. The modified action level was calculated to be 43.5 ppm (87% x 50 ppm). The areas of PCB contamination to be removed during the removal action will be selected based on sample results with PCB concentrations greater than or equal to 43.5 ppm. In the context of the discussions that follow, "PCB contamination" refers to materials in which the PCB concentration exceeds the modified action level.

4.1.1 Concrete Flooring - First Floor

PCB contamination on the first floor was evaluated through the collection of composite concrete floor samples and discrete floor samples as discussed in Sections 2.3.1 and 2.3.2. The PCB analytical results for concrete samples collected from the first floor are presented in Table 4-1 (arranged in order by sector, beginning with Row A) and Figure 2-1. The following table presents a list of the 22 sectors on the first floor where the concentration of PCBs exceeded 43.5

ppm (the adjusted threshold per Section 4.1.8) in the composite sample(s). These sectors are highlighted in yellow on Figure 2-1.

Concrete Flooring, Sectors on First Floor, PCBs > 43.5 ppm

Sector ID	Area Type	Max. PCB Conc. (Composite Sample)
C23	Process	106.6 ppm
C24	Process	116.1 ppm
D23	Process	102.1 ppm
D24	Process	59.5 ppm
E23	Process	80.6 ppm
E24	Process	178.2 ppm
F24	Process	54.6 ppm
G28	Process	119.0 ppm
G30	Process	98.3 ppm
H09	Process	61.0 ppm
H11	Process	83.9 ppm
H13	Process	115.8 ppm
H14	Process	87.6 ppm
H15	Process	134.7 ppm
H16	Process	72.2. ppm
H18	Process	60.9 ppm
J14	Process	61.4 ppm
H29 (north half)	Process	93.5 ppm
J14	Process	61.4 ppm
J15	Process	56.9 ppm
J16	Process	112.2 ppm
K16	Traffic	54.1 ppm

As discussed in Section 2.3.1, individual aliquot samples were analyzed when the PCB result for the corresponding composite sample was between 12.5 ppm and 50 ppm, indicating that the PCB concentration in one or more of the aliquots could have potentially exceeded 50 ppm. Accordingly, 236 aliquots from the first floor were analyzed for PCBs. The aliquot results are presented in Table 4-3 and Figure 2-1. The following table presents a list of the quadrants where the concentration of PCBs exceeded the 43.5 ppm action level. These quadrants are highlighted in yellow on Figure 2-1.

Concrete Flooring, Quadrants on First Floor, PCBs > 43.5 ppm

Sector & Quadrant ID	Area Type	Max. PCB Concentration (Aliquot Sample)
A19D	Traffic	59.4 ppm
B23C	Traffic	155.7 ppm
B24C	Traffic	70.8 ppm
D14A	Process	56.7 ppm
F18C	Process	46.4 ppm
F18D	Process	58.6 ppm
F22D	Process	50.6 ppm
F23C	Process	55.3 ppm
F23D	Process	79.6 ppm
G15B	Process	66.4 ppm
G29B	Process	65.8 ppm
G29C	Process	121.2 ppm
H10B	Process	51.5 ppm
H10C	Process	87.2 ppm
H12A	Process	49.5 ppm
H12C	Process	46.3 ppm
J09A	Process	74.9 ppm
J09D	Process	51.1 ppm
J10A	Process	43.6 ppm
J17A	Process	63.5 ppm
K12B	Traffic	52.6 ppm
K12C	Traffic	78.5 ppm
K14B	Traffic	52.5 ppm
K14D	Traffic	44.6 ppm
K15C	Traffic	66.6 ppm
K18A	Traffic	45.9 ppm
K18D	Traffic	63.4 ppm

The PCB contamination (PCBs > 43.5 ppm) on the first floor covers a total area of approximately 11,300 ft^2. PCB contamination on the first floor is most widespread in and around the following areas: a 2,800 ft^2 area around Sector D24, a 3,400 ft^2 area around Sector H14, a 1,200 ft^2 area near Sector H10, and a 1,200 ft^2 area near Sector G29. Except for the area near Sector G29, these areas are located within the former production floor where lathes and other process equipment were once operated. The PCB-contaminated area near Sector G29 corresponds to the former drum storage area. The remaining PCB contamination on the first floor is not concentrated in any one area. Although most of the PCB contamination was found in former process areas, PCBs were detected at levels exceeding the action level in several former traffic areas (including Rows A, B, and K). PCBs were not detected in the discrete samples collected outside the main sampling grid. An estimate of the quantity of TSCA waste for the first floor is presented in Section 4.2.

4.1.2 Concrete Flooring – Second Floor and Penthouses

PCB contamination on the second floor and penthouses was also evaluated through the collection of composite concrete floor samples and discrete floor samples as discussed in Sections 2.3.1 and 2.3.2. The PCB analytical results for all samples collected from the second floor and penthouses are presented in Table 4-2 (arranged in order by sector, beginning with Row A) and Figure 2-2. The concentration of PCBs did not exceed the action level in concrete floor samples collected in the penthouses. The following table presents a list of the 3 sectors on the second floor where the concentration of PCBs exceeded 43.5 ppm in the composite sample(s). These sectors are highlighted in yellow on Figure 2-2.

Concrete Flooring, Sectors on Second Floor, PCBs > 43.5 ppm

Sector ID	Area Type	Max. PCB Conc. (Composite Sample)
C13	Process	50.7 ppm
D13	Process	45.8 ppm
E13	Process	76.2 ppm

The results from the 95 aliquots samples from the second floor are presented in Table 4-3. The following table presents a list of the quadrants for which the PCB concentration in the aliquot sample exceeded 43.5 ppm. These quadrants are highlighted in yellow on Figure 2-2.

Concrete Flooring, Quadrants on Second Floor, PCBs > 43.5 ppm

Sector & Quadrant ID	Area Type	Max. PCB Concentration (Aliquot Sample)
C19C	Process	55.8 ppm
D11C	Process	54.2 ppm
D12C	Process	76.7 ppm
F13C	Process	50.6 ppm
F24A	Process	45.3 ppm

Sector & Quadrant ID	Area Type	Max. PCB Concentration (Aliquot Sample)
H11D	Process	52.5 ppm
H13A	Process	84.0 ppm
H13C	Process	64.6 ppm
H22A	Process	64.3 ppm
H24D	Process	46.1 ppm

The PCB contamination on the second floor covers a total area of approximately 2,200 ft^2. The most widespread PCB contamination is a 1,000 ft^2 area near Sector D13. The remaining PCB contamination on the second floor is scattered within former production areas. Four contaminated quadrants are located within the limits of the office area south of Row G. PCB levels exceeding the action level were not detected within former traffic areas or in the discrete samples collected outside the main sampling grid. An estimate of the quantity of TSCA waste for the second floor is presented in Section 4.2.

4.1.3 Concrete Flooring - Basement

PCB contamination of concrete flooring in the basement was evaluated through the collection of discrete concrete samples as discussed in Section 2.3.2. The samples were collected from oil-stained areas identified during the building contamination pre-inspection. The PCB analytical results of all concrete floor samples collected in the basement are presented in Table 4-4 (arranged in order by sample ID) and Figure 2-3. The following table presents a list of samples in which the concentration of PCBs exceeded 43.5 ppm. The proposed areas of PCB contamination associated with these samples are highlighted in yellow on Figure 2-3.

Concrete Flooring in Basement, PCBs > 43.5 ppm

Sample Location	Depth Interval	PCB Concentration
CFB02	0 – 1 in.	50.9 ppm
CFB05	0 – 1 in.	46.2 ppm
CFB08	0 – 1 in.	60.7 ppm
CFB08	1 – 2 in.	87.7 ppm
CFB10	0 – 1 in.	79.2 ppm
CFB10	1 – 2 in.	57.2 ppm
CFB11	0 – 1 in.	89.6 ppm
CFB12	0 – 1 in.	429.3 ppm
CFB12	1 – 2 in.	344.6 ppm
CFB15	1 – 2 in.	48.4 ppm

Sample Location	Depth Interval	PCB Concentration
CFB21	0 – 1 in.	728.2 ppm
CFB21	1 – 2 in.	375.4 ppm
CFB22	0 – 1 in.	170.1 ppm

The PCB contamination in concrete flooring in the basement covers a total area of approximately 4,900 ft^2. As shown on Figure 2-3, a 2,800 ft^2 linear zone of PCB contamination exists between Rows 20 and Row 21. Another large area PCB contamination (approximately 1,500 ft^2) is located around Sector G11. Two smaller areas of contamination are located adjacent to the chip chute and within Sector B13. The four areas of PCB contamination in the basement do not necessarily correlate with PCB contamination found on the first floor. The detection of PCB concentrations above the action level in several samples from the 1 – 2 in. depth interval suggests that PCB contamination extends deeper than 2 inches in many areas. An estimate of the quantity of TSCA waste associated with concrete flooring in the basement is presented in Section 4.2

4.1.4 Concrete Columns and Walls

PCB samples were collected from oil-stained columns in the basement. Samples were collected from either the vertical column or the base of the column, depending on where the most significant oil-staining was observed. Concrete samples were also collected from the oil-stained portions of the three walls in the chip chute area of the basement. The PCB analytical results of all column and wall samples collected from the basement are presented in Table 4-5 (arranged in order by sample ID) and Figure 2-3. PCB concentrations were below the action level in all samples collected form the chip chute walls. Only one concrete column sample contained PCBs at a concentration exceeding 43.5 ppm:

- Column F12 (sample ID CC21-01) – 146.6 ppm

Note that all column and wall samples were collected from 0 – 1 in. below the surface. The generally low PCB concentrations in column and wall samples suggest that PCB contamination does not significantly penetrate vertical surfaces.

As explained in Section 2.3.3, samples were not collected from all of the oil-stained columns in the basement. To increase the certainty that TSCA wastes associated with the columns are addressed during the removal action, the unsampled concrete columns located within or near areas of PCB-contaminated flooring will be included in the removal action. These columns include:

- Column B12
- Column B18
- Column C18
- Column H14
- Column H15

Based on field measurements of oil-staining during the investigation, the total area of PCB contamination associated with concrete columns is estimated to be 230 ft^2.

4.1.5 Soil Flooring in Basement

PCB contamination of soil flooring in the basement was evaluated through the collection soil samples as discussed in Section 2.3.4. The majority of samples were collected from oil-stained areas identified during the building contamination pre-inspection, as it was assumed that oil-staining would indicate PCB contamination (if present). To validate this assumption, soil samples were also collected from non-oil-stained areas. The PCB analytical results of all soil samples collected from the basement are presented in Table 4-6 (arranged in order by sample ID) and Figure 2-3. The following table presents a list of samples in which the concentration of PCBs exceeded 43.5 ppm. The proposed areas of PCB contamination associated with these samples are highlighted in yellow on Figure 2-3.

Soil Flooring in Basement, PCBs > 43.5 ppm

Sample Location	Depth Interval	PCB Concentration
SS23	0 – 6 in.	277.7 ppm
SS26	0 – 6 in.	462.5 ppm
SS27	0 – 6 in.	67.7 ppm
SS28	0 – 6 in.	576.4 ppm
SS47	0 – 6 in.	97.0 ppm
SS48	0 – 6 in.	132.6 ppm
SS48	12 – 18 in.	70.7 ppm

The PCB contamination found in basement soils covers a total area of approximately 1,510 ft^2. As shown on Figure 2-3, the six areas of PCB soil contamination in basement (Areas A through E and the floor beneath the chip chute waste pile) are located on the west side of the building, beneath former production areas on the first floor. Areas A through E are located near or adjacent to the concrete floor in the basement. PCB levels exceeding the action level within Areas A through E were detected only in the upper 6 in. of soil, suggesting that PCB contamination is likely shallow (i.e., less than 1 ft bgs). As anticipated, PCB contamination was detected in both soil borings (SS47 and SS48) below the chip chute waste pile. The relatively high concentration of PCBs in the 12 – 18 in. sample from SS28 indicates that PCB contamination below the waste pile extends deeper than 18 in. bgs. Similar to PCB-contaminated concrete flooring (refer to Section 4.1.4), the PCB contamination in basement soils west of Row 10 does not appear to correspond with PCB contamination on the first floor. However, the zone of PCB contamination around Sector H15 may be linked to the contamination found in the same area on the first floor (refer to Section 4.1.1). An estimate of the quantity of TSCA waste associated with soil flooring in the basement is presented in Section 4.2.

The PCB levels in all soil samples collected from oil-stained areas east of Row 22 (beneath the former quench tanks) were well below the action level, suggesting that the observed oil-staining is likely attributed to non-PCB containing oils/lubricants (probably quench oils). However, low levels of PCBs were still detected in this area.

Soil samples were also collected in areas of the basement where oil-staining was not observed during the building contamination pre-inspection. These samples were collected to verify the assumption that oil-staining was a reliable indicator of elevated PCB contamination. It was assumed that elevated PCB levels, if present, would correlate to visual observations of oil-staining. Accordingly, most of the soil samples collected for PCB characterization were located in oil-stained areas. The PCB analytical results of the soil samples from non-oil-stained areas are summarized below.

Soil Flooring in Basement, Samples from Non-Oil-Stained Areas

Sample Location	PCB Concentration (0 – 6 in.)	PCB Concentration (6 – 12 in.)
SS04	ND	ND
SS06	ND	ND
SS12	ND	1.4 ppm
SS13	1.6 ppm	ND
SS31	3.9 ppm	---
SS34	ND	ND

ND = Not detected above method detection limit or reporting limit.

Despite low-level detections of PCBs in non-oil-stained soils, most of the results were non-detect (ND) as anticipated. Additionally, none of the results were considered with respect to the TSCA action level. Thus, the results suggest that oil-staining is a reliable indicator of the potential for PCB contamination may be present. However, the observation of oil-staining does not necessarily indicate the presence of TSCA waste.

4.1.6 Soil Outside Building 3

PCB contamination in the soil outside Building 3 near the chip chute loading area was evaluated through the collection soil samples as discussed in Section 2.3.5. The PCB analytical results of all soil samples collected from this area are presented in Table 4-7 (arranged in order by sample ID) and Figure 2-4. The following table presents a list of samples in which the concentration of PCBs exceeded 43.5 ppm. The proposed areas of PCB contamination associated with these samples is shown on Figure 2-4.

Soil Outside Building 3, PCBs > 43.5 ppm

Sample Location	Depth Interval	PCB Concentration
SS36	0 – 6 in.	465.8 ppm
SS37	0 – 6 in.	390.7 ppm
SS37	36 – 42 in.	384.2 ppm
SS38	0 – 6 in.	170.8 ppm
SS39	0 – 6 in.	75.8 ppm
SS41	0 – 6 in.	144.3 ppm
SS42	0 – 6 in.	516.8 ppm
SS43	0 – 6 in.	449.2 ppm
SS44	0 – 6 in.	69.8 ppm
SS45	0 – 6 in.	304.2 ppm
SS45	36 – 42 in.	196.1 ppm
SS46	0 – 6 in.	64.5 ppm
SS46	32 – 38 in.	76.9 ppm
SS50	0 – 6 in.	49.5 ppm
SS51	0 – 6 in.	295.5 ppm

The PCB contamination outside Building 3 covers a total area of approximately 2,200 ft^2. Most of the PCBs exceeding the action level were detected in samples collected from 0 – 6 in., which

4.1.8 MS/MSD Recoveries

An important aspect of the investigation was the evaluation of the potential matrix effects on the outcome of PCB analytical results. This was particularly important for results near or slightly above 50 ppm due to the possibility of false negatives. If quantified levels were diluted due to matrix effects, the area associated with the sample could be incorrectly eliminated as a contaminated area and would not be included in the removal action.

The laboratory began MS/MSD analysis using the site samples collected specifically as MS/MSDs. The laboratory spiked these samples at 1.5 ppm with Aroclor-106 and Aroclor-1260. The laboratory eventually reported interference problems due to high concentrations of PCBs in the site samples, which made it difficult to distinguish the spike from site contamination. Most of these results were not included in the analytical data packages, because the recoveries could not be calculated and/or were outside laboratory control limits. The laboratory then began randomly selecting site samples as MS/MSDs. When the sample contained site PCBs that were present at low concentrations or ND, the MS/MSD results met QC limits, and the laboratory included them in the analytical data packages.

It was later determined that the laboratory was not spiking MS/MSDs at a concentration of 50 ppm in accordance with the QAPP. The 50 ppm spiking level was specified for evaluating matrix effects near the TSCA action level. To facilitate this evaluation, another corrective action was implemented at that time. The laboratory was directed to analyze 10 sets of MS/MSDs spiked at 50 ppm with Aroclor-1248 (the most prevalent site PCB). Ten site samples with PCB concentrations known to be low or non-detect (ND) were selected for MS and MSD analysis for a total of 20 sample analyses. Each MS or MSD sample was analyzed using dual column confirmation for a total of 40 sample runs. The results of this MS/MSD corrective action study are presented in Appendix A. The following observations are made with regard to these results:

- PCB recoveries for a sample spiked at 50 ppm ranged from 87% to 129%.
- The average PCB recovery was 95%, corresponding to 47.5 ppm.
- The recoveries for 8 of the 40 sample runs were less than 90%.
- PCB recoveries exceeded 100% in 5 of 40 sample runs; conversely, the recovery was less than 100% in 35 of 40 samples.
- Overall, 70% (28 of 40) of the MS/MSD recoveries were less than 95%.
- The recoveries for 27 of the 40 sample runs were between 90% and 100%.

The MS/MSD recoveries, although within control limits, were less than 100% for the majority of the sample runs. The MS/MSD results suggest that matrix effects may have caused the results for some site samples with actual concentrations near 50 ppm to be quantified below 50 ppm. As stated in the introduction to Section 4.0, a modified action level of 43.5 ppm was established based on the lowest achieved MS recovery of 87%. This approach reduces the possibility of false negative results and the uncertainty associated with imperfect contaminant recoveries during analysis. It also provides a higher confidence level that materials with PCB concentrations greater than 50 ppm are identified for the removal action.

Overall, MS/MSD samples (those spiked at 1.5 ppm combined with those spiked at 50 ppm) were analyzed at the required frequency of 5% of total composite samples. Some of the early results were outside of control limits due to the concentration effects from site PCBs. However, all of the MS/MSD results after implementation of the corrective actions discussed above were found to meet laboratory QC criteria. The laboratory provided a case narrative detailing the initial problems encountered with MS/MSD analyses, including the raw data which demonstrates the effects of high concentrations of PCBs in site media. Corrective actions that were implemented by the laboratory were also discussed. The case narrative is included as an attachment to the QCSR. Due to their importance in evaluating matrix effects near the TSCA action level, the results of the 10 MS/MSDs spiked at 50 ppm are included as Appendix A of this report.

4.1.9 Duplicates, Splits, and Rinsates

As discussed in Section 3.3, duplicate, split, and rinsate samples were collected as part of the QA/QC program. Duplicate and split samples were collected and analyzed to assess laboratory precision. Rinsate samples were collected to assess the effectiveness of field decontamination procedures and the possibility of cross-contamination. The duplicate sample results are presented in Tables 4-1 through 4-8 adjacent to the results for the corresponding primary sample. A correlation coefficient (r^2) was calculated to be 0.97 for all of the duplicate samples collected during the investigation. This correlation coefficient indicates very good comparability between the primary and duplicate sample results, and it meets EPA's criteria for "definitive" data. The duplicate sample results will be addressed in further detail in the CQCR. The results for split samples will be discussed in the CQAR prepared by USACE Omaha. The rinsate sample results are presented in Table 4-9. All of the rinsate results were non-detect for PCBs, which verifies that field equipment was properly decontaminated between samples.

4.1.10 Data Gaps Analysis

In accordance with the "checkerboard" protocol discussed in Section 2.3.1, sectors that were not initially designated for sampling were sampled during the investigation if the PCB results from opposite/adjacent sectors did not agree (i.e., one contaminated, the other non-contaminated). This approach minimized the potential for data gaps from the checkerboard sampling scheme. The decision to collect samples from the additional sectors was based on preliminary PCB results submitted by the laboratory during the field work. Although the preliminary results were estimated values subject to change, they facilitated the identification of the additional concrete floor samples prior to demobilizing from the site.

Final sample results were received over time following completion of the field work. For many of the samples, the final results and the preliminary results were different. Due to the changes in the results from preliminary to final, it was determined that PCB data gaps existed for the following unsampled sectors:

- CF1K11
- CF1K13
- CF1K17

When the same sampling protocol is applied for individual, the following quadrants represent data gaps due to inconsistent PCB results from adjacent quadrants.

- CF1A20A
- CF1B25B
- CF1C14B
- CF1D13D
- CF1E18C
- CF1F19A
- CF1K19A
- CF2D19D
- CF2E11D
- CF2F14B
- CF2G11C
- CF2G22B

To address these data gaps, composite concrete floor samples will be collected during the initial phase of the removal action. The samples will be collected in accordance with a SAP prepared specifically for the removal action.

The proposed limits of PCB contamination (refer to Figure 2-3) in the basement are based on a limited number of samples. The sample locations were spaced in a manner that provided adequate areal coverage of oil-stained portions of the flooring in the basement. Due the large surface area of the basement and the limited number of samples available, PCB samples were not highly concentrated in any one area. Thus, the limits of PCB contamination shown in Figure 2-3 are estimated from limits of observed oil-staining and/or the results of nearby samples. For contaminated areas such as Areas B – E and CFB21, it is reasonable to base the horizontal extent of contamination on a single sample result, because the oil-staining is limited to a small area. However, the delineation of contamination is considerably less certain for larger areas defined by a single PCB result or areas based upon PCB results from widely spaced samples. For this reason, confirmation samples will be collected during the removal action to increase the certainty that the full extent of PCB contamination was properly removed. Confirmation samples will be collected in the basement as follows:

- From the base and walls of all soil excavations
- From areas where concrete is selectively removed within stained areas and where nearby sample results were too widely spaced to provide adequate definition of the horizontal extent of contamination
- From areas where it was difficult to discern oil-staining (i.e., wet areas)
- From the soil below the concrete flooring

A plan depicting the proposed confirmation sample locations will be included in the RAWP.

Furthermore, data gaps exist for the areas of contamination located outside the building near the chip chute. Despite relatively concentrated sample locations, elevated PCB levels may be present beyond the limits of the sampling grid, particularly to the north and east (refer to Figure 2-4). This assessment is based on PCB results that exceeded the action level in samples collected from the outer perimeter of the sampling grid, including SS51 (295 ppm), SS45 (412 ppm), and SS46 (76.9 ppm). The horizontal extent of PCB contamination is also uncertain for the area associated with sample SS50, where the concentration was 49.5 ppm. Based on current plans, these areas will not be included in the upcoming removal action. Additional delineation samples should be collected prior to removing TSCA waste from this area at a future date.

4.2 Estimate of PCB TSCA Waste Quantities

The results of PCB characterization sampling are presented in Section 4.1. The locations of areas of PCB contamination exceeding the modified action level (43.5 ppm) are highlighted in yellow on Figures 2-1, 2-2, 2-3, and 2-4. Table 4-10 presents a summary of the quantities of TSCA waste by area of concern. The quantities from Table 4-10 will be used in estimating the costs for removing and disposing PCB-contaminated materials during the removal action. Details of the removal action at Building 3 will be presented in the RAWP. The following assumptions or clarifications were used in calculating the quantities of TSCA waste presented in Table 4-10:

- The entire thickness of flooring in a contaminated sector or quadrant will be removed.
- Thickness of first and second floor where horizontal I-beams support the flooring – 8 in.
- Thickness of first floor where vertical columns support the flooring – 16 in.
- Removal of concrete includes overages in some areas to prevent cantilevered (unsupported) flooring. To eliminate cantilevers, it will be necessary to cut beyond the limits of contamination to the nearest support beam or row of intermediate columns. The design for concrete flooring removal is discussed in detail in the RAWP.
- Assumed density for concrete flooring - 185 lbs/ft^3.
- Assumed density for soil - 120 lbs/ft^3.
- Assumed density for waste pile material - 150 lbs/ft^3.
- Depth of contamination for soil flooring in basement (not including chip chute) - 1 ft bgs.
- Depth of contamination of soil flooring below chip chute waste pile – 3 ft bgs.
- Average depth of chip chute waste pile – 2 ft.
- Depth of contamination for soil outside building - 5 ft bgs.
- PCB contamination on concrete columns will be cleaned in-situ; does not significantly impact waste quantities with regards to off-site disposal.

4.3 Removal Action Waste Pre-Determination

The selection of an appropriate disposal facility for the removal action at Building 3 will be contingent upon the TSCA and RCRA profiles of the various waste materials (concrete, soil, waste) to be shipped off-site for disposal. The TSCA profiles were thoroughly evaluated through the collection of PCB samples as discussed in Section 4.1. Samples were also collected during the investigation to preliminarily determine if Building 3 materials would be classified as RCRA hazardous wastes. These samples were analyzed for TCLP SVOCs and TCLP Metals.

Additional samples were collected to determine the anticipated level of petroleum hydrocarbons in the waste materials through analysis of GRO/DRO. The results of removal action waste pre-determination sampling are presented in Tables 4-11 and 4-12. The following observations are made with regards to the results:

- The materials to be removed from Building 3 (concrete, soil, waste pile) will not be classified as a RCRA hazardous waste, because all RCRA metals and SVOCs were below the TCLP regulatory limits.
- GROs were not detected in the soil or waste samples.
- The DRO levels presented in Table 4-12 are not high enough to preclude Building 3 materials from being disposed in a TSCA landfill.
- The detection of elevated levels of DROs in concrete and soil indicates that hydrocarbon and PCB contamination is co-mingled.

Overall, the materials removed from Building 3 will be classified as a TSCA waste only due to elevated PCB concentrations. The sampling data from this investigation will be used to complete the initial waste profile documents for the disposal of Building 3 materials during the removal action.

4.4 Health and Safety Pre-Assessment

During the removal action, workers may potentially be exposed to Building 3 waste materials through inhalation of dust generated from construction activities (i.e., saw cutting) and through direct handling of waste materials. To preliminarily assess the health and safety concerns associated with exposure to contaminants present in Building 3 materials, representative samples were collected during the investigation. These samples were analyzed for Total SVOCs and Total Metals. The results of health and safety pre-assessment sampling are presented in Tables 4-13 and 4-14. The following observations are made with regard to the results:

- Heavy metals are generally not present in Building 3 concrete at significantly elevated levels. With minor exceptions, there does not appear to be a significant difference in heavy metal concentrations between PCB-contaminated concrete and non-PCB-contaminated concrete.
- Slightly elevated levels of cadmium, copper, lead, and mercury were detected in the soil sample from SS23. This sample was located in an oil-stained portion of the soil flooring

contaminated with PCBs. In contrast, the heavy metal concentrations in the soil sample from SS34, located in a non-oil stained areas of the basement, were noticeably lower than SS23.

- Slightly elevated levels of heavy metals were detected in soil sample SS43, located within the PCB contaminated area outside Building 3 (adjacent to the chip chute).

- As anticipated, the concentrations of heavy metals in the sample from the chip chute waste pile were elevated.

- Mercury was detected in both samples from soil in the basement, but was ND in the sample from outside the building.

- Minor amounts of SVOCs compounds were present Building 3 concrete, soil, and waste materials. The SVOCs included polycyclic aromatic hydrocarbons (PAHs), such as benzo(a)pyrene, benzo(b)fluoranthene, and fluorene.

- No SVOCs were detected in the soil sample from SS34, located in a non-oil-stained area of the basement.

During future construction (removal and demolition) activities, the highest potential for exposure to Building 3 contaminants is through the inhalation of dust, because site contaminants (excluding asbestos) may be attached to the dust particles. Respiratory protection, such as APRs with HEPA filters, should be used for construction activities that generate appreciable amounts of dust. If workers are protected from dust inhalation through the use of respirators, workers should be adequately protected from exposure to the PCBs, metals, and SVOCs potentially present in the concrete and soil. Given typically low vapor pressures of SVOCs, combined with the low concentrations of SVOCs detected in the health and safety samples, SVOCs are not anticipated to represent a significant vapor inhalation hazard. Therefore, based on the data, no further respiratory protection beyond what is necessary for dust exposure is recommended. Dermal contact with PCBs and heavy metals present in concrete and soil is also a concern. Dermal exposure should be minimized through the use of gloves and coveralls.

4.5 IDW Assessment

As discussed in Section 2.6, 29 drums of IDW (water and absorbents) were generated during the investigation. IDW samples were collected to evaluate options for disposal. IDW water samples were analyzed for PCBs, Total SVOCs, Total Metals, and heptane. IDW absorbent samples were analyzed for PCBs, TCLP SVOCs, and TCLP Metals. The results of IDW sampling are presented in Tables 4-15, 4-16, and 4-17.

The IDW water sample results (IDW-01 through IDW-04) indicated that PCBs were not detected above the MDL; thus, the IDW is not considered a TSCA waste. Additionally, metal and SVOC concentrations were not high enough to render the IDW water a hazardous waste, nor was heptane detected in any of the samples. Nevertheless, the concentrations of lead, copper, and iron in one or more of the initial samples were above the discharge limits for the St. Louis Metropolitan Sewer District. The St. Louis Metropolitan Sewer District was contacted to discuss the results and the possibility for discharging to the sewer system. According to a compliance representative with the district, the concentrations of SVOCs were low enough for discharge; and, except for elevated levels of lead, copper, and iron, the IDW water was otherwise acceptable for discharge. [Note: Each drum of IDW water consisted of cooling/decontamination water and approximately 0.5 – 2 in. of concrete sediment that settled to the bottom of the drum. To ensure that samples IDW-01 through IDW-04 were representative of the IDW, the samples contained proportional amounts of water and concrete sediment.] It was proposed that the liquid portion of the IDW be sampled separately at a later date. If the liquid portion of the IDW was determined to be acceptable for discharge, a permit for discharge would be issued as long as the IDW was filtered to ensure that the concrete sediment did not enter the sewer system.

Additional IDW samples (IDW-06 and IDW-07) were collected on September 6, 2001. The samples consisted of the liquid above the sediment, but did not contain any of the sediment. The samples were analyzed for Total Metals. The results are presented under "Follow-Up Sampling (September 6, 2001)" in Table 4-16. The results indicated that all regulated metals were below St. Louis Metropolitan Sewer District discharge limits. Based on the significant reduction in the concentration of iron, copper, and lead between the initial and follow-up samples, it was concluded that the elevated levels of metals in the initial IDW samples was due to the presence of concrete sediment. The St. Louis Metropolitan Sewer District issued an approval for discharge with the condition that the effluent be filtered to retain the concrete sediment. The approval letter is included as Appendix B.

The results of the IDW absorbent sample analyses indicate that the absorbents are not classified as a RCRA hazardous waste, because RCRA constituents were below the TCLP regulatory limits. The absorbent sample contained PCBs at a concentration of 1.4 ppm, which is well below the TSCA action level of 50 ppm. Thus, based on the sample results, the IDW absorbents are acceptable for disposal in a municipal landfill. However, individual landfills may have restrictions on the disposal of PCB-contaminated materials; and, it may be necessary to apply for a special waste permit.

4.6 Air Sampling Results

Air sampling was conducted to assess personnel exposure to dust and silica from field activities (refer to Section 2.7). The air sampling results are summarized in Table 4-18. The results suggest that respirable dust was emitted at appreciable levels during concrete saw cutting, pulverizing, and drilling operations during the investigation. Respirable dust levels were negligible during concrete coring and sample weighing/packaging. The levels of airborne silica were generally negligible for the five operations that air samples were collected.

4.7 Other Findings in Support of RAWP

During and after the investigation, the field crew collected other information relevant to the upcoming removal action. This information included structural considerations associated with removal of concrete flooring, data related to the thickness and presence of the concrete cap, handling of ACM in the basement, the handling of sewer piping potentially contaminated with PCBs, and the condition of the SLAAP rail spur.

4.7.1 Structural Considerations

ACI contacted a structural engineer from Wideman & Associates of St. Louis to assist in evaluating the impacts of removing concrete flooring during the removal action. The primary concerns with regards to structural safety are the load capacity of the flooring and the potential for creating unsupported (cantilevered) concrete flooring during removal. During the investigation, it was determined that two different flooring support designs are used in Building 3. The second floor and majority of the first floor is supported by horizontal I-beams between the primary building columns at 20 ft. on center (o.c.) each direction. Intermediate horizontal beams (in the east-west direction) are present at 6 ft. 8 in. o.c. between the primary beams. The slab thickness in these areas is approximately 8 inches, including the concrete cap. Reinforcement was determined to be12 in. o.c. in the north-south direction and 6 in. o.c. in the east-west direction. A portion of the first floor (approximately 40,000 ft^2) between Rows 9 and 20 is not supported by horizontal I-beams. Rather, this area is supported by the primary building columns at 20 ft. o.c.and intermediate concrete columns at 10 ft. o.c. each direction. The concrete slab thickness in this area was determined to be as much as 16 in, with reinforcement at 8 in. o.c. in the east-west direction and 9 in. o.c. in the north-south direction. The structural design for concrete removal activities is addressed in detail in the RAWP.

4.7.2 Presence and Thickness of Concrete Cap

The presence and thickness of the concrete cap is important for determining the quantity of waste materials that will be generated during the removal action, as it is anticipated that concrete from the cap will be disposed along with underlying contaminated flooring. The thickness of the cap was ascertained by measuring the length of the cap-portion of concrete cores. The interface between the cap and original floor could easily be determined through visual observation of the cores due to differences in aggregate gradation. Additionally, the majority of the cores separated at the cap/original floor interface, while the portion of the core from the original flooring remained in tact.

The cap was found to be present in all investigation areas on the first floor east of the wall at Row 9 and on the second floor south of the offices beginning at the wall at Row G. On the first floor west of the wall at Row 9, the cap was only present in Row B. The remainder of this area consisted of a layer of concrete of unknown origin, but with an aggregate composition different from both the cap and the original flooring. This layer was not believed to be cap material, and it appeared to have been poured considerably earlier than the cap. As discussed in Section 2.11, the layer was incorporated in the composite concrete floor samples collected west of Row 9. Where the cap was present on the first and second floors, the average thickness was 2.2 in. and 2.8 in., respectively. The maximum thickness was 4.74 in. on the first floor and 3.75 in. on the second floor. Tables 4-19 and 4-20 present the measurements of cap thickness for each aliquot core hole from areas where the cap was present.

During concrete floor sampling, three holes were deliberately cored through the floor at six locations to evaluate the total thickness of the floor. Based on measurements of these cores holes, the floor was found to be approximately 8 in. thick in the areas supported by horizontal I-beams and 16 in. thick in the area of the first floor supported by vertical columns. Accordingly, depths of 8 in. and 16 in. were used in calculating the TSCA waste quantities in Section 4.2.

4.7.3 Asbestos-Containing Materials

A significant quantity of piping in the basement will need to be removed during removal action to provide clearance for construction equipment. The majority of this piping is covered with asbestos-containing insulation. During the investigation, the field crew surveyed the basement to map out the significant pipe runs. The locations of the pipe runs, including the number, size, types, and linear footage, are depicted in Figure 4-1. This figure also identifies the several thousand feet of piping covered with ACM.

Much of the ACM in the basement is damaged. During the investigation, numerous pieces or fragments of "presumed" ACM (PACM) debris were observed on the surface of both the concrete flooring and soil flooring. Samples of PACM were collected during a follow-up visit on September 23, 2001. Four bulk samples of PACM (unknown fibrous and powdered materials) were collected from the surface of PCB-contaminated concrete and soil flooring identified for removal action. Additionally, wipe samples were collected from concrete aisles that will serve as haul routes during the removal action. Two of the wipe samples were collected from areas that appeared "clean" (where ACM was not anticipated to be present). Another wipe sample was collected from beneath a damaged ACM pipe run. The asbestos sampling results are summarized in the following table; hard copies are included in Appendix C.

Asbestos Sampling Results

Media	Location (Surface)	Sample Type	Result
Debris	Sector H16 (soil)	Bulk	Positive- 75%
Debris	Sector H19 (concrete)	Bulk	Positive – 12%
Debris	Sector F17 (concrete)	Bulk	Positive – 2%
Debris	Sector H15 (soil)	Bulk	Positive – 12%
Dust	Sector D17 (concrete)	Wipe	Positive – 3 bundles
Dust	Sector H15 (concrete)	Wipe	Positive – 7 bundles
Dust	Sector F18 (concrete)	Wipe	Positive – 21 bundles

The sampling results indicate that the surface of the soil and concrete flooring in the basement is contaminated with asbestos above the regulatory level of 1%. The detection of asbestos in wipe samples from presumed non-contaminated areas suggests that loose asbestos fibers and debris are present on horizontal surfaces in the basement. Based on the presence of ACM debris on the surface of the soil, it is believed that ACM is also present below the surface of the soil from historic foot traffic over the ACM debris.

The presence of uncontained ACM debris in the basement will impact the removal action as follows:

- To prevent loose ACM debris from becoming airborne, the surface of soil and concrete flooring will need to be cleaned prior to commencing other field activities in the basement. An industrial vacuum such as a Vacloader® 522 (refer to Appendix C) may be used to clean the contaminated flooring.

- Piping in the basement may be removed with ACM in place. However, the pipe must be double-wrapped with polyethylene sheeting and sealed at both ends. Damaged ACM must be repaired (using duct tape or spray glue) prior to wrapping with polyethylene sheeting. At each point where the pipe is to be cut, a 1 – 2 ft. section of ACM must be removed using by glove-bag methods.

- In accordance with MDNR regulations, only Missouri-certified asbestos workers may perform asbestos work in the basement (floor cleaning and ACM pipe removal). At least one Missouri-certified supervisor must be present at all times during asbestos work. Additionally, MDNR and the City of St. Louis Air Program must be notified of the abatement project.

- Personal and area air sampling must be conducted prior to commencing asbestos work, during asbestos removal activities, and following the completion of the asbestos work. Air sampling must be conducted by a Missouri-certified air sampler.

- Respiratory protection will be required (most likely a half-face APR with HEPA filters). Asbestos abatement workers must wear full-body coveralls.

- A wet decontamination station will be required for the floor cleaning operations. At minimum, the decontamination station will consist of a "clean room" (to change from regular clothing to PPE), shower room, and equipment storage room. A diagram of a typical decontamination station is included in Appendix C. Shower water must be filtered prior to discharge.

4.7.4 Sewer Piping

As shown on Figure 4-1, there are numerous 4-in. and 6-in. cast iron sewer lines in the basement. These lines connect to floor drains on the first floor. Most of these floor drains are located in former process areas, and it is likely that the sewer lines carried wastewater from process operations. Thus, the lines may be contaminated with PCBs and other contaminants associated with industrial wastewater discharges (such as heavy metals and cyanide). Due the potential for being classified as a TSCA waste, the sewer lines will be sampled for PCBs during the removal action. Some of the sewer lines currently obstruct proposed removal action haul routes and/or are connected the flooring designated for removal. Thus, it is anticipated that all sewer lines west of Row 20 will be removed and disposed during the removal action. The sampling results will be used in determining the proper method for disposal (i.e., TSCA waste, RCRA waste, special municipal waste).

4.7.5 Condition of Rail Lines

Rail transport will be evaluated as a possible method of transporting wastes to the disposal facility during the removal action. However, the rail spur at SLAAP is currently unusable, and would need to be repaired/restored to be placed into active service. To preliminarily determine the costs required to restore the spur, a rail contractor performed an evaluation of the condition of the lines. The following is a list of repairs required to permit use of the on-site tracks:

- Adjust, clean, and lubricate switch points
- Spike switch point to ensure alignment to the north track
- Saw cut and remove asphalt for rail car wheel flange ways
- Replace 152 cross-ties
- Clear all brush from 15 feet of center line
- Clean out wheel flange way

5.0 References

Arrowhead Contracting, Inc. 2001a. *Alternatives Evaluation for Removal of PCBs. St. Louis Army Ammunition Plant, St. Louis, Missouri.* March.

Arrowhead Contracting, Inc. 2001b. *Sampling and Analysis Plan. Determination of PCB TSCA Waste Quantities, Building 3, St. Louis Army Ammunition Plant, St. Louis, Missouri.* June.

Arrowhead Contracting, Inc. 2001c. *Draft Safety, Health, and Emergency Response Plan. Determination of PCB TSCA Waste Quantities, Building 3, St. Louis Army Ammunition Plant, St. Louis, Missouri.* June.

Environmental Protection Agency. 1996. *Soil Screening Guidance: Technical Background Document.* May.

Environmental Protection Agency. 1992. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846.*

United States Aviation and Missile Command. 2000. *Final Environmental Baseline Survey Report, Saint Louis Army Ammunition Plant, St. Louis, Missouri.* December.

TABLES

Table 2-1. Summary of Samples Collected for PCB Analysis

Areas of Concern	Media/Type	No. of Sample Locations	Identification of Locations/Sectors Sampled	Depth Intervals	Analytes	No. of Primary Samples	No. Duplicate Samples	No. of MS/MSD Samples	No. of Equipment Rinsates
First Floor - Row A (Traffic Areas)	Concrete Floor - Composite	5	A13, A15, A19, A23, A25	0 - 1 in. and 1 - 2 in.	PCBs	10	1	1	1
First Floor - Row B (Traffic Areas)	Concrete Floor - Composite	9	B04, B10, B16, B18, B20, B23, B24, B26, B28	0 - 1 in. and 1 - 2 in.	PCBs	18	2	2	2
First Floor - Row B (Process Areas)	Concrete Floor - Composite	2	B06, B08	0 - 1 in. and 2 - 3 in.	PCBs	4			
First Floor - Row C (Traffic Areas)	Concrete Floor - Composite	1	C03	0 - 1 in. and 1 - 2 in.	PCBs	2		1	1
First Floor - Row C (Process Areas)	Concrete Floor - Composite	11	C09, C11, C13, C15, C17, C19, C21, C22, C23, C24, C25	0 - 1 in. and 2 - 3 in.	PCBs	22	3		
First Floor - Row D (Process Areas)	Concrete Floor - Composite	11	D08, D10, D12, D14, D16, D18, D21, D22, D23, D24, D25	0 - 1 in. and 2 - 3 in.	PCBs	22	2		
First Floor - Row E (Traffic Area)	Concrete Floor - Composite	1	E03	0 - 1 in. and 1 - 2 in.	PCBs	2			
First Floor - Row E (Process Areas)	Concrete Floor - Composite	14	E09, E11, E13, E15, E17, E19, E21, E22, E23, E24, E25, E31, E33, E37	0 - 1 in. and 2 - 3 in.	PCBs	28	2	3	3
First Floor - Row F (Traffic Areas)	Concrete Floor - Composite	3	F28, F30, F32	0 - 1 in. and 1 - 2 in.	PCBs	6			
First Floor - Row F (Process Areas)	Concrete Floor - Composite	10	F08, F10, F12, F14, F16, F18, F22, F23, F24, F29	0 - 1 in. and 2 - 3 in.	PCBs	20	2	1	1
First Floor - Row G (Traffic Areas)	Concrete Floor - Composite	3	G03, G23, G33	0 - 1 in. and 1 - 2 in.	PCBs	6			
First Floor - Row G (Process Areas)	Concrete Floor - Composite	16	G09, G10, G11, G13, G14, G15, G16, G17, G18, G19, G25, G27, G28, G29, G30, G31	0 - 1 in. and 2 - 3 in.	PCBs	32	6	2	2
First Floor - Row H (Traffic Areas)	Concrete Floor - Composite	6	H24, H28, H30, H34, H36, H38	0 - 1 in. and 1 - 2 in.	PCBs	12	1	1	1
First Floor - Row H (Process Areas)	Concrete Floor - Composite	14	H08, H09, H10, H11, H12, H13, H14, H15, H16, H17, H18, H19, H22, H29	0 - 1 in. and 2 - 3 in.	PCBs	28	2		
First Floor - Row J (Traffic Areas)	Concrete Floor - Composite	4	J23, J25, J35, J37	0 - 1 in. and 1 - 2 in.	PCBs	8	2	1	

Table 2-1. Summary of Samples Collected for PCB Analysis

Areas of Concern	Media/Type	No. of Sample Locations	Identification of Locations/Sectors Sampled	Depth Intervals	Analytes	No. of Primary Samples	No. Duplicate Samples	No. of MS/MSD Samples	No. of Equipment Rinsates
First Floor - Row J (Process Areas)	Concrete Floor - Composite	12	J08, J09, J10, J11, J13, J14, J15, J16, J17, J18, J19, J21	0 - 1 in. and 2 - 3 in.	PCBs	24	2	1	1
First Floor - Row K (Traffic Areas)	Concrete Floor - Composite	13	K09, K10, K12, K14, K15, K16, K18, K20, K22, K24, K34, K36, K38	0 - 1 in. and 1 - 2 in.	PCBs	26	2	1	1
First Floor - Row K (Process Area)	Concrete Floor - Composite	1	K08	0 - 1 in. and 2 - 3 in.	PCBs	2			
Second Floor - Row A (Traffic Areas)	Concrete Floor - Composite	3	A19, A21, A23	0 - 1 in. and 1 - 2 in.	PCBs	6			
Second Floor - Row B (Traffic Areas)	Concrete Floor - Composite	7	B09, B11, B13, B18, B20, B22, B24	0 - 1 in. and 1 - 2 in.	PCBs	14		1	1
Second Floor - Row C (Process Areas)	Concrete Floor - Composite	7	C10, C12, C13, C14, C19, C23, C25	0 - 1 in. and 2 - 3 in.	PCBs	14	4		
Second Floor - Row D (Process Areas)	Concrete Floor - Composite	8	D09, D11, D12, D13, D14, D18, D22, D24	0 - 1 in. and 2 - 3 in.	PCBs	16	1		
Second Floor - Row E (Process Areas)	Concrete Floor - Composite	7	E10, E12, E13, E14, E19, E23, E25	0 - 1 in. and 2 - 3 in.	PCBs	14		2	2
Second Floor - Row F (Process Areas)	Concrete Floor - Composite	6	F09, F11, F13, F18, F22, F24	0 - 1 in. and 2 - 3 in.	PCBs	12	2		
Second Floor - Row G (Process Areas)	Concrete Floor - Composite	6	G12, G13, G14, G19, G23, G25	0 - 1 in. and 2 - 3 in.	PCBs	12	1		
Second Floor - Row H (Process Areas)	Concrete Floor - Composite	7	H11, H12, H13, H14, H18, H22, H24	0 - 1 in. and 2 - 3 in.	PCBs	14	4	1	1
Second Floor - Row J (Process Areas)	Concrete Floor - Composite	6	J12, J13, J14, J19, J23, J25	0 - 1 in. and 2 - 3 in.	PCBs	12		2	2
Miscellaneous Oil Stained Areas - First Floor	Concrete Floor - Discrete	5	A06, A12, E31, E33, E37	0 - 1 in. and 1 - 2 in.	PCBs	10	2		
Miscellaneous Oil Stained Areas - Second Floor	Concrete Floor - Discrete	2	A33, K34	1 - 1 in. and 1 - 2 in.	PCBs	4		1	1
Concrete Flooring in Basement	Concrete Floor - Discrete	22	CFB01 - CFB22	0 - 1 in. and 1 - 2 in. (except CFB22)	PCBs	43	5	2	2
Penthouses	Concrete Floor - Discrete	4	CFP01 - CFP04	0 - 1 in. and 1 - 2 in.	PCBs	8	1	1	1

Table 2-1. Summary of Samples Collected for PCB Analysis

Areas of Concern	Media/Type	No. of Sample Locations	Identification of Locations/Sectors Sampled	Depth Intervals	Analytes	No. of Primary Samples	No. Duplicate Samples	No. of MS/MSD Samples	No. of Equipment Rinsates
Columns in Basement	Concrete Column	22	CC01 - CC22	0 - 1 in.	PCBs	22	2	1	1
Walls - Chip Chute Area in Basement	Concrete Wall	6	CW01 - CW06	0 - 1 in.	PCBs	6			
Soil Flooring in Basement	Soil	34	SS01 - SS34	0 - 6 in. and 6 - 12 in.	PCBs	68	6	4	4
Basement - Below Chip Chute Waste Pile	Soil	2	SS47 and SS48	0 - 6 in. and 12 - 18 in.	PCBs	4			
Outside Building Adjacent to Chip Chute Area and Loading Dock	Soil	17	SS35 - SS46 and SS49 - SS53	0 - 6 in. (except SS52) and 30 - 42 in. (approx.)	PCBs	33	3	2	2
Catch Basin in Basement	Waste Material	2	CB01 and CB02	0 - 12 in. and 12 in. - depth	PCBs	4			
Chip Chute Waste Pile in Basement	Waste Material	3	WP01 - WP03	surface (0 in.) - depth	PCBs	3			
TOTALS		**312**				**591**	**58**	**31**	**30**

Table 2-2. Summary of Concrete Aliquots Submitted for PCB Analysis

Primary Sample ID	Aliquots	No. Samples
CF1A19-01	A, B, C, D	4
CF1B16-01	A, B, C, D	4
CF1B23-01	A, B, C, D	4
CF1B23-12	A, B, C, D	4
CF1B24-12	A, B, C, D	4
CF1C22-01	A, B, C, D	4
CF1D10-01	A, B, C, D	4
CF1D14-01	A, B, C, D	4
CF1D16-01	A, B, C, D	4
CF1D22-01	A, B, C, D	4
CF1D22-23	A, B, C, D	4
CF1D24-23	A, B, C, D	4
CF1E13-01	A, B, C, D	4
CF1E17-01	A, B, C, D	4
CF1E22-01	A, B, C, D	4
CF1F10-01	A, B, C, D	4
CF1F16-01	A, B, C, D	4
CF1F18-01	A, B, C, D	4
CF1F22-01	A, B, C, D	4
CF1F22-23	A, B, C, D	4
CF1F23-01	A, B, C, D	4
CF1F23-23	A, B, C, D	4
CF1F24-01	A, B, C, D	4
CF1F28-01	A, B, C, D	4
CF1F28-12	A, B, C, D	4
CF1G15-01	A, B, C, D	4
CF1G23-01	A, B, C, D	4
CF1G25-01	A, B, C, D	4
CF1G25-23	A, B, C, D	4
CF1G29-01	A, B, C, D	4
CF1G29-23	A, B, C, D	4
CF1H10-01	A, B, C, D	4
CF1H10-23	A, B, C, D	4
CF1H12-01	A, B, C, D	4
CF1H12-23	A, B, C, D	4
CF1H16-23	A, B, C, D	4
CF1H18-23	A, B, C, D	4
CF1J09-01	A, B, C, D	4
CF1J09-23	A, B, C, D	4
CF1J10-01	A, B, C, D	4
CF1J10-23	A, B, C, D	4
CF1J13-01	A, B, C, D	4
CF1J13-23	A, B, C, D	4
CF1J15-01	A, B, C, D	4
CF1J17-01	A, B, C, D	4
CF1J35-01	A, B, C, D	4
CF1K09-01	A, B, C, D	4
CF1K09-12	A, B, C, D	4
CF1K10-01	A, B, C, D	4
CF1K10-12	A, B, C, D	4
CF1K12-01	A, B, C, D	4

Table 2-2. Summary of Concrete Aliquots Submitted for PCB Analysis

Primary Sample ID	Aliquots	No. Samples
CF1K12-12	A, B, C, D	4
CF1K14-01	A, B, C, D	4
CF1K14-12	A, B, C, D	4
CF1K15-01	A, B, C, D	4
CF1K15-12	A, B, C, D	4
CF1K16-01	A, B, C, D	4
CF1K18-01	A, B, C, D	4
CF1K18-12	A, B, C, D	4
CF2A19-01	A, B, C, D	4
CF2B11-01	A, B, C, D	4
CF2C19-23	A, B, C, D	4
CF2D11-01	A, B, C, D	4
CF2D12-01	A, B, C, D	4
CF2D13-01	A, B, C, D	4
CF2D13-23	A, B, C, D	4
CF2D22-01	A, B, C, D	4
CF2D22-23	A, B, C, D	4
CF2D24-01	A, B, C, D	4
CF2E19-01	A, B, C, D	4
CF2E23-01	A, B, C, D	4
CF2F11-01	A, B, C	3
CF2F13-01	A, B, C, D	4
CF2F22-01	A, B, C, D	4
CF2F22-23	A, B, C, D	4
CF2F24-01	A, B, C, D	4
CF2H11-01	A, B, C, D	4
CF2H13-01	A, B, C, D	4
CF2H13-23	A, B, C, D	4
CF2H22-01	A, B, C, D	4
CF2H22-23	A, B, C, D	4
CF2H24-01	A, B, C, D	4
CF2H24-23	A, B, C, D	4

TOTAL **331**

Table 2-3. Summary of Samples Collected for Removal Action Waste Pre-Determination

Area of Concern	Media/Type	Data Quality Objective	Identification of Sectors/Locations Sampled	Depth Intervals	Analytes	No. of Samples
First Floor - PCB Contaminated Flooring	Concrete Floor	Waste Characterization	CF1C23	0 - 1 in.	TCLP SVOCs TCLP Metals DRO	1
Oil Stained Soil Flooring in Basement	Soil	Waste Characterization	SS23	0 - 18 in.	TCLP SVOCs TCLP Metals DRO	1
Outside Builidng Adjacent to Chip Chute and Loading Dock	Soil	Waste Characterization	SS43	0 - 36 in.	TCLP SVOCs TCLP Metals GRO/DRO	1
Outside Builidng Adjacent to Chip Chute and Loading Dock	Soil	Waste Characterization	SS40	36 - 40 in.	GRO/DRO	1
Outside Builidng Adjacent to Chip Chute and Loading Dock	Water	Waste Characterization	SS45L	Groundwater	GRO/DRO VOCs	1
Chip Chute Waste Pilie in Basement	Waste Material	Waste Characterization	WP02	0 in. - depth	TCLP SVOCs TCLP Metals GRO/DRO	1
Catch Basin in Basement	Waste Material	Waste Characterization	CB02	0 - 12 in.	TCLP SVOCs TCLP Metals GRO/DRO	1
TOTAL						**7**

Table 2-4. Summary of Samples Collected for Health and Safety Pre-Assessment

Area of Concern	Media/Type	Identification of Sectors/Locations Sampled	Depth Intervals	Analytes	No. of Samples
First Floor - PCB Contaminated Flooring	Concrete Floor	CF1C23, CF1D24, CF1E23	0 - 1 in.	Total SVOCS Total Metals	3
First and Second Floors - Non-PCB Contaminated Flooring	Concrete Floor	CF1D40, CF2C25	0 - 1 in. and 1 - 2 in.	Total SVOCS Total Metals	4
Oil Stained Soil Flooring in Basement	Soil	SS23	0 - 18 in.	Total SVOCS Total Metals	1
Non-Oil Stained Flooring in Basement	Soil	SS34	0 - 18 in.	Total SVOCS Total Metals	1
Outside Builidng Adjacent to Chip Chute and Loading Dock	Soil	SS43	0 - 36 in.	Total SVOCS Total Metals	1
Chip Chute Waste Pilie in Basement	Waste Material	WP02	0 in. - depth	Total SVOCS Total Metals	1
Catch Basin in Basement	Waste Material	CB01	0 - 12 in.	Total SVOCS Total Metals	1
TOTAL					**12**

Table 2-5. Investigation-Derived Waste Summary

Drum ID	Contents	IDW Sample ID (Composite Sample)
1	Cooling/Decontamination Fluids - Coring Operations	---
2	Decontamination Fluids - Concrete Pulverizer	IDW-03
3	Cooling/Decontamination Fluids - Coring Operations	---
4	Cooling/Decontamination Fluids - Coring Operations	IDW-01 IDW-07
5	Decontamination Fluids - Concrete Pulverizer and Saw	IDW-04
6	Cooling/Decontamination Fluids - Coring Operations	IDW-02
7	Absorbents - Coring Operations	IDW-05
8	Cooling/Decontamination Fluids - Coring Operations	IDW-01 IDW-07
9	Cooling/Decontamination Fluids - Coring Operations	---
10	Cooling/Decontamination Fluids - Coring Operations	IDW-02
11	Decontamination Fluids - Concrete Pulverizer and Saw	IDW-03
12	Decontamination Fluids - Concrete Pulverizer and Saw	IDW-04
13	Absorbents - Coring Operations	---
14	Cooling/Decontamination Fluids - Coring Operations	IDW-01
15	Decontamination Fluids - Concrete Pulverizer	---
16	Decontamination Fluids - Concrete Pulverizer	IDW-04
17	Cooling/Decontamination Fluids - Coring Operations	---
18	Absorbents - Coring Operations	---
19	Cooling/Decontamination Fluids - Coring Operations	IDW-02
20	Cooling/Decontamination Fluids - Coring Operations	---
21	Decontamination Fluids - Concrete Saw	IDW-03 IDW-06
22	Cooling/Decontamination Fluids - Coring Operations	IDW-01
23	Decontamination Fluids - Concrete Pulverizer and Saw	---
24	Cooling/Decontamination Fluids - Coring Operations	---
25	Absorbents - Coring Operations	IDW-05
26	Cooling/Decontamination Fluids - Coring Operations	IDW-02
27	Cooling/Decontamination Fluids - Coring Operations	---
28	Absorbents - Coring Operations	---
29	Decontamination Fluids - Concrete Pulverizer and Saw	IDW-06

Notes: IDW-01 - IDW-04 (water samples) were analyzed for Total SVOCs, Total Metals, PCBs, and VOCs (heptane).

IDW-05 (absorbent sample) was analyzed for TCLP SVOCs, TCLP Metals, and PCBs.

IDW-06 and IDW-07 (follow-up samples collected on September 6, 2001) were analyzed for Total Metals. These samples consisted of the liquid portion of the IDW only.

Table 2-6. Air Sampling Summary

Sample ID	Type	Operation	Location	Pump	Flow Rate (LPM)	Total Time (Minutes)	Total Vol. (L)
AREA062101	Area	Concrete Saw Cutting	Former Paint Stripping Room	Hi-vol	4	355	1,420
PERS062201	Personal	Concrete Pulverizer	Former Garage	Low-vol	2	270	540
PER062301	Personal	Sample Weigh and Pack	Former Garage	Low-vol	2	220	440
AREA062501	Area	Concrete Coring	Second Floor - West Side	Hi-vol	4	230	920
PERS062701	Personal	Concrete Drilling	Basement	Low-vol	2.5	220	550

LPM = Liters per minute

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1A05-01	Composite	Traffic Area	1.2		
CF1A05-12	Composite	Traffic Area	ND		
CF1A06-01	Discrete	Traffic Area	0.4	CF1A506-01	0.5
CF1A06-12	Discrete	Traffic Area	ND		
CF1A12-01	Discrete	Traffic Area	32.7	CF1A512-01	35.0
CF1A12-12	Discrete	Traffic Area	14.5		
CF1A13-01	Composite	Traffic Area	3.4	CF1A513-01	3.9
CF1A13-12	Composite	Traffic Area	0.8		
CF1A15-01	Composite	Traffic Area	3.0		
CF1A15-12	Composite	Traffic Area	ND		
CF1A19-01	Composite	Traffic Area	20.0		
CF1A19-12	Composite	Traffic Area	5.9		
CF1A21-01	Composite	Traffic Area	ND		
CF1A21-12	Composite	Traffic Area	ND		
CF1A23-01	Composite	Traffic Area	2.2		
CF1A23-12	Composite	Traffic Area	ND		
CF1A25-01	Composite	Traffic Area	1.5		
CF1A25-12	Composite	Traffic Area	ND		
CF1B04-01	Composite	Traffic Area	ND	CF1B504-01	ND
CF1B04-12	Composite	Traffic Area	ND		
CF1B06-01	Composite	Process Area	ND		
CF1B06-23	Composite	Process Area	ND		
CF1B08-01	Composite	Process Area	3.3		
CF1B08-23	Composite	Process Area	0.8		
CF1B10-01	Composite	Traffic Area	0.5		
CF1B10-12	Composite	Traffic Area	0.5		
CF1B16-01	Composite	Traffic Area	ND		
CF1B16-12	Composite	Traffic Area	ND		
CF1B18-01	Composite	Traffic Area	ND		
CF1B18-12	Composite	Traffic Area	ND		
CF1B20-01	Composite	Traffic Area	ND		
CF1B20-12	Composite	Traffic Area	ND		
CF1B23-01	Composite	Traffic Area	31.9		
CF1B23-12	Composite	Traffic Area	40.3		
CF1B24-01	Composite	Traffic Area	8.2		
CF1B24-12	Composite	Traffic Area	16.4		
CF1B26-01	Composite	Traffic Area	4.1	CF1B526-01	3.9
CF1B26-12	Composite	Traffic Area	2.6		
CF1B28-01	Composite	Traffic Area	8.8		
CF1B28-12	Composite	Traffic Area	ND		
CF1C03-01	Composite	Traffic Area	1.6		
CF1C03-12	Composite	Traffic Area	0.3		
CF1C09-01	Composite	Process Area	0.9		
CF1C09-23	Composite	Process Area	ND		
CF1C11-01	Composite	Process Area	ND	CF1C511-01	ND
CF1C11-23	Composite	Process Area	ND		
CF1C13-01	Composite	Process Area	4.6		
CF1C13-23	Composite	Process Area	0.8		
CF1C15-01	Composite	Process Area	2.9		
CF1C15-23	Composite	Process Area	3.1		
CF1C17-01	Composite	Process Area	1.0		
CF1C17-23	Composite	Process Area	0.6		
CF1C19-01	Composite	Process Area	ND	CF1C519-01	ND

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1C19-23	Composite	Process Area	ND		
CF1C21-01	Composite	Process Area	0.8		
CF1C21-23	Composite	Process Area	0.3		
CF1C22-01	Composite	Process Area	12.6		
CF1C22-23	Composite	Process Area	11.9		
CF1C23-01	Composite	Process Area	106.6	CF1C523-01	60.8
CF1C23-23	Composite	Process Area	84.2		
CF1C24-01	Composite	Process Area	116.1		
CF1C24-23	Composite	Process Area	73.1		
CF1C25-01	Composite	Process Area	9.7		
CF1C25-23	Composite	Process Area	1.5		
CF1D08-01	Composite	Process Area	ND		
CF1D08-23	Composite	Process Area	ND		
CF1D10-01	Composite	Process Area	14.0		
CF1D10-23	Composite	Process Area	7.0		
CF1D12-01	Composite	Process Area	1.7		
CF1D12-23	Composite	Process Area	0.8		
CF1D14-01	Composite	Process Area	24.1		
CF1D14-23	Composite	Process Area	7.2		
CF1D16-01	Composite	Process Area	16.9	CF1D516-01	18.5
CF1D16-23	Composite	Process Area	7.8		
CF1D18-01	Composite	Process Area	5.2		
CF1D18-23	Composite	Process Area	3.7		
CF1D21-01	Composite	Process Area	1.2		
CF1D21-23	Composite	Process Area	0.8		
CF1D22-01	Composite	Process Area	21.5		
CF1D22-23	Composite	Process Area	18.7		
CF1D23-01	Composite	Process Area	102.1		
CF1D23-23	Composite	Process Area	92.3		
CF1D24-01	Composite	Process Area	59.5		
CF1D24-23	Composite	Process Area	58.0		
CF1D25-01	Composite	Process Area	6.8	CF1D525-01	5.4
CF1D25-23	Composite	Process Area	0.5		
CF1E03-01	Composite	Traffic Area	ND		
CF1E03-12	Composite	Traffic Area	ND		
CF1E09-01	Composite	Process Area	1.5		
CF1E09-23	Composite	Process Area	ND		
CF1E11-01	Composite	Process Area	6.6		
CF1E11-23	Composite	Process Area	1.9		
CF1E13-01	Composite	Process Area	34.5		
CF1E13-23	Composite	Process Area	12.2		
CF1E15-01	Composite	Process Area	3.6		
CF1E15-23	Composite	Process Area	2.7		
CF1E17-01	Composite	Process Area	ND		
CF1E17-23	Composite	Process Area	ND		
CF1E19-01	Composite	Process Area	ND		
CF1E19-23	Composite	Process Area	ND		
CF1E21-01	Composite	Process Area	3.8		
CF1E21-23	Composite	Process Area	2.2		
CF1E22-01	Composite	Process Area	24.2	CF1E522-01	22.9
CF1E22-23	Composite	Process Area	12.2		
CF1E23-01	Composite	Process Area	80.6		
CF1E23-23	Composite	Process Area	70.6		

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1E24-01	Composite	Process Area	178.2	CF1E524-01	176.8
CF1E24-23	Composite	Process Area	67.9		
CF1E25-01	Composite	Process Area	7.7		
CF1E25-23	Composite	Process Area	3.5		
CF1E31-01	Discrete	Process Area	ND		
CF1E31-12	Discrete	Process Area	ND		
CF1E33-01	Discrete	Process Area	ND		
CF1E33-12	Discrete	Process Area	ND		
CF1E37-01	Discrete	Process Area	ND		
CF1E37-12	Discrete	Process Area	ND		
CF1F08-01	Composite	Process Area	4.0	CF1F508-01	4.7
CF1F08-23	Composite	Process Area	2.1		
CF1F10-01	Composite	Process Area	13.6		
CF1F10-23	Composite	Process Area	7.8		
CF1F12-01	Composite	Process Area	3.3		
CF1F12-23	Composite	Process Area	0.9		
CF1F14-01	Composite	Process Area	7.4		
CF1F14-23	Composite	Process Area	3.2		
CF1F16-01	Composite	Process Area	14.7		
CF1F16-23	Composite	Process Area	12.3		
CF1F18-01	Composite	Process Area	17.6		
CF1F18-23	Composite	Process Area	7.1		
CF1F22-01	Composite	Process Area	23.0		
CF1F22-23	Composite	Process Area	16.0		
CF1F23-01	Composite	Process Area	38.6		
CF1F23-23	Composite	Process Area	38.3		
CF1F24-01	Composite	Process Area	51.2	CF1F524-01	54.6
CF1F24-23	Composite	Process Area	20.1		
CF1F28-01	Composite	Traffic Area	14.9		
CF1F28-12	Composite	Traffic Area	9.8		
CF1F29-01	Composite	Process Area	6.2		
CF1F29-23	Composite	Process Area	2.8		
CF1F30-01	Composite	Traffic Area	5.5		
CF1F30-12	Composite	Traffic Area	6.4		
CF1F32-01	Composite	Traffic Area	ND		
CF1F32-12	Composite	Traffic Area	ND		
CF1G03-01	Composite	Traffic Area	ND		
CF1G03-12	Composite	Traffic Area	ND		
CF1G09-01	Composite	Process Area	1.8	CF1G509-01	1.6
CF1G09-23	Composite	Process Area	ND		
CF1G10-01	Composite	Process Area	3.9		
CF1G10-23	Composite	Process Area	2.1		
CF1G11-01	Composite	Process Area	3.9		
CF1G11-23	Composite	Process Area	ND		
CF1G13-01	Composite	Process Area	4.7	CF1G513-01	4.5
CF1G13-23	Composite	Process Area	2.1		
CF1G14-01	Composite	Process Area	10.4		
CF1G14-23	Composite	Process Area	2.5		
CF1G15-01	Composite	Process Area	25.5		
CF1G15-23	Composite	Process Area	2.6		
CF1G16-01	Composite	Process Area	ND	CF1G516-01	ND
CF1G16-23	Composite	Process Area	ND		
CF1G17-01	Composite	Process Area	ND		

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1G17-23	Composite	Process Area	ND		
CF1G18-01	Composite	Process Area	0.2		
CF1G18-23	Composite	Process Area	ND		
CF1G19-01	Composite	Process Area	ND	CF1G519-01	ND
CF1G19-23	Composite	Process Area	ND		
CF1G23-01	Composite	Traffic Area	21.5		
CF1G23-12	Composite	Traffic Area	4.8		
CF1G25-01	Composite	Process Area	2.3		
CF1G25-23	Composite	Process Area	ND		
CF1G27-01	Composite	Process Area	ND	CF1G527-01	ND
CF1G27-23	Composite	Process Area	ND		
CF1G28-01	Composite	Process Area	119.0		
CF1G28-23	Composite	Process Area	95.8		
CF1G29-01	Composite	Process Area	35.0		
CF1G29-23	Composite	Process Area	24.9		
CF1G30-01	Composite	Process Area	66.4	CF1G530-01	64.4
CF1G30-23	Composite	Process Area	98.3		
CF1G31-01	Composite	Process Area	ND		
CF1G31-23	Composite	Process Area	ND		
CF1G33-01	Composite	Traffic Area	ND		
CF1G33-12	Composite	Traffic Area	ND		
CF1H08-01	Composite	Process Area	ND		
CF1H08-23	Composite	Process Area	2.4		
CF1H09-01	Composite	Process Area	61.0	CF1H509-01	54.1
CF1H09-23	Composite	Process Area	31.0		
CF1H10-01	Composite	Process Area	37.8	CF1H510-01	35.7
CF1H10-23	Composite	Process Area	30.9		
CF1H11-01	Composite	Process Area	83.9		
CF1H11-23	Composite	Process Area	65.3		
CF1H12-01	Composite	Process Area	39.4		
CF1H12-23	Composite	Process Area	18.3		
CF1H13-01	Composite	Process Area	115.8		
CF1H13-23	Composite	Process Area	88.0		
CF1H14-01	Composite	Process Area	87.6		
CF1H14-23	Composite	Process Area	65.0		
CF1H15-01	Composite	Process Area	120.4		
CF1H15-23	Composite	Process Area	134.7		
CF1H16-01	Composite	Process Area	72.2		
CF1H16-23	Composite	Process Area	46.2		
CF1H17-01	Composite	Process Area	0.2		
CF1H17-23	Composite	Process Area	ND		
CF1H18-01	Composite	Process Area	60.9		
CF1H18-23	Composite	Process Area	42.8		
CF1H19-01	Composite	Process Area	6.1		
CF1H19-23	Composite	Process Area	ND		
CF1H22-01	Composite	Process Area	2.9		
CF1H22-23	Composite	Process Area	1.6		
CF1H24-01	Composite	Traffic Area	2.6		
CF1H24-12	Composite	Traffic Area	2.0		
CF1H28-01	Composite	Traffic Area	8.7		
CF1H28-12	Composite	Traffic Area	ND		
CF1H29-01	Composite	Process Area	93.5		
CF1H29-23	Composite	Process Area	9.1		

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1H30-01	Composite	Traffic Area	3.8	CF1H530-01	5.4
CF1H30-12	Composite	Traffic Area	ND		
CF1H32-01	Composite	Traffic Area	ND		
CF1H32-12	Composite	Traffic Area	ND		
CF1H34-01	Composite	Traffic Area	2.7		
CF1H34-12	Composite	Traffic Area	0.3		
CF1H36-01	Composite	Traffic Area	4.0		
CF1H36-12	Composite	Traffic Area	ND		
CF1H38-01	Composite	Traffic Area	1.2		
CF1H38-12	Composite	Traffic Area	ND		
CF1J08-01	Composite	Process Area	0.8		
CF1J08-23	Composite	Process Area	0.3		
CF1J09-01	Composite	Process Area	41.2		
CF1J09-23	Composite	Process Area	16.7		
CF1J10-01	Composite	Process Area	23.8		
CF1J10-23	Composite	Process Area	19.2		
CF1J11-01	Composite	Process Area	8.4		
CF1J11-23	Composite	Process Area	4.6		
CF1J13-01	Composite	Process Area	25.0		
CF1J13-23	Composite	Process Area	18.2		
CF1J14-01	Composite	Process Area	61.4	CF1J514-01	56.5
CF1J14-23	Composite	Process Area	41.6		
CF1J15-01	Composite	Process Area	56.5	CF1J515-01	55.0
CF1J15-23	Composite	Process Area	56.9		
CF1J16-01	Composite	Process Area	112.2		
CF1J16-23	Composite	Process Area	69.0		
CF1J17-01	Composite	Process Area	20.0		
CF1J17-23	Composite	Process Area	1.5		
CF1J18-01	Composite	Process Area	4.3		
CF1J18-23	Composite	Process Area	0.3		
CF1J19-01	Composite	Process Area	5.0		
CF1J19-23	Composite	Process Area	2.7		
CF1J21-01	Composite	Process Area	3.7		
CF1J21-23	Composite	Process Area	4.6		
CF1J23-01	Composite	Traffic Area	ND		
CF1J23-12	Composite	Traffic Area	ND		
CF1J25-01	Composite	Traffic Area	0.8	CF1J525-01	ND
CF1J25-12	Composite	Traffic Area	ND		
CF1J35-01	Composite	Traffic Area	8.1	CF1J535-01	7.0
CF1J35-12	Composite	Traffic Area	0.8		
CF1J37-01	Composite	Traffic Area	0.6		
CF1J37-12	Composite	Traffic Area	ND		
CF1K08-01	Composite	Process Area	ND		
CF1K08-23	Composite	Process Area	ND		
CF1K09-01	Composite	Traffic Area	18.2		
CF1K09-23	Composite	Traffic Area	13.6		
CF1K10-01	Composite	Traffic Area	16.7		
CF1K10-12	Composite	Traffic Area	22.9		
CF1K12-01	Composite	Traffic Area	32.7		
CF1K12-12	Composite	Traffic Area	37.9		
CF1K14-01	Composite	Traffic Area	25.1		
CF1K14-12	Composite	Traffic Area	32.9		
CF1K15-01	Composite	Traffic Area	24.3		

Table 4-1. PCB Results for Concrete Floor Samples - First Floor

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF1K15-12	Composite	Traffic Area	24.1		
CF1K16-01	Composite	Traffic Area	54.1		
CF1K16-12	Composite	Traffic Area	43.4		
CF1K18-01	Composite	Traffic Area	25.1	CF1K518-01	18.7
CF1K18-12	Composite	Traffic Area	16.4		
CF1K20-01	Composite	Traffic Area	ND	CF1K520-01	ND
CF1K20-12	Composite	Traffic Area	ND		
CF1K22-01	Composite	Traffic Area	2.5		
CF1K22-12	Composite	Traffic Area	0.5		
CF1K24-01	Composite	Traffic Area	ND		
CF1K24-12	Composite	Traffic Area	ND		
CF1K34-01	Composite	Traffic Area	0.7		
CF1K34-12	Composite	Traffic Area	ND		
CF1K36-01	Composite	Traffic Area	ND		
CF1K36-12	Composite	Traffic Area	ND		
CF1K38-01	Composite	Traffic Area	ND		
CF1K38-12	Composite	Traffic Area	ND		

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-2. PCB Results for Concrete Floor Samples - Second Floor and Penthouses

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF2A19-01	Composite	Traffic Area	ND		
CF2A19-12	Composite	Traffic Area	ND		
CF2A21-01	Composite	Traffic Area	3.7		
CF2A21-12	Composite	Traffic Area	0.5		
CF2A23-01	Composite	Traffic Area	0.7		
CF2A23-12	Composite	Traffic Area	ND		
CF2A33-01	Discrete	Traffic Area	ND		
CF2A33-12	Discrete	Traffic Area	ND		
CF2B09-01	Composite	Traffic Area	ND		
CF2B09-12	Composite	Traffic Area	ND		
CF2B11-01	Composite	Traffic Area	31.6		
CF2B11-12	Composite	Traffic Area	ND		
CF2B13-01	Composite	Traffic Area	0.7		
CF2B13-12	Composite	Traffic Area	ND		
CF2B18-01	Composite	Traffic Area	1.4		
CF2B18-12	Composite	Traffic Area	ND		
CF2B20-01	Composite	Traffic Area	0.5		
CF2B20-12	Composite	Traffic Area	ND		
CF2B22-01	Composite	Traffic Area	0.4		
CF2B22-12	Composite	Traffic Area	ND		
CF2B24-01	Composite	Traffic Area	ND		
CF2B24-12	Composite	Traffic Area	ND		
CF2C10-01	Composite	Process Area	ND		
CF2C10-23	Composite	Process Area	ND		
CF2C12-01	Composite	Process Area	5.7		
CF2C12-23	Composite	Process Area	1.5		
CF2C13-01	Composite	Process Area	43.4	CF2C513-01	42.7
CF2C13-23	Composite	Process Area	50.7		
CF2C14-01	Composite	Process Area	9.7	CF2C514-01	10.5
CF2C14-23	Composite	Process Area	ND		
CF2C19-01	Composite	Process Area	7.5	CF2C519-01	7.9
CF2C19-23	Composite	Process Area	19.4		
CF2C23-01	Composite	Process Area	3.6	CF2C523-01	3.7
CF2C23-23	Composite	Process Area	2.2		
CF2C25-01	Composite	Process Area	0.7		
CF2C25-23	Composite	Process Area	ND		
CF2D09-01	Composite	Process Area	ND	CF2D509-01	ND
CF2D09-23	Composite	Process Area	ND		
CF2D11-01	Composite	Process Area	16.4		
CF2D11-23	Composite	Process Area	ND		
CF2D12-01	Composite	Process Area	35.6		
CF2D12-23	Composite	Process Area	8.2		
CF2D13-01	Composite	Process Area	45.8		
CF2D13-23	Composite	Process Area	36.1		
CF2D14-01	Composite	Process Area	1.2		
CF2D14-23	Composite	Process Area	0.2		
CF2D18-01	Composite	Process Area	5.8		
CF2D18-23	Composite	Process Area	ND		
CF2D22-01	Composite	Process Area	23.4		
CF2D22-23	Composite	Process Area	21.7		
CF2D24-01	Composite	Process Area	22.1		
CF2D24-23	Composite	Process Area	11.6		
CF2E10-01	Composite	Process Area	ND		

Table 4-2. PCB Results for Concrete Floor Samples - Second Floor and Penthouses

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF2E10-23	Composite	Process Area	ND		
CF2E12-01	Composite	Process Area	ND		
CF2E12-23	Composite	Process Area	ND		
CF2E13-01	Composite	Process Area	76.2		
CF2E13-23	Composite	Process Area	50.9		
CF2E14-01	Composite	Process Area	0.3		
CF2E14-23	Composite	Process Area	ND		
CF2E19-01	Composite	Process Area	13.7		
CF2E19-23	Composite	Process Area	8.1		
CF2E23-01	Composite	Process Area	23.2		
CF2E23-23	Composite	Process Area	16.4		
CF2E25-01	Composite	Process Area	1.4		
CF2E25-23	Composite	Process Area	0.4		
CF2F09-01	Composite	Process Area	ND		
CF2F09-23	Composite	Process Area	ND		
CF2F11-01	Composite	Process Area	17.7	CF2F511-01	17.8
CF2F11-23	Composite	Process Area	8.6		
CF2F13-01	Composite	Process Area	16.9		
CF2F13-23	Composite	Process Area	12.3		
CF2F18-01	Composite	Process Area	1.5		
CF2F18-23	Composite	Process Area	ND		
CF2F22-01	Composite	Process Area	29.0		
CF2F22-23	Composite	Process Area	19.4		
CF2F24-01	Composite	Process Area	24.7	CF2F524-01	21.2
CF2F24-23	Composite	Process Area	8.8		
CF2G12-01	Composite	Process Area	2.9		
CF2G12-23	Composite	Process Area	ND		
CF2G13-01	Composite	Process Area	ND		
CF2G13-23	Composite	Process Area	ND		
CF2G14-01	Composite	Process Area	ND		
CF2G14-23	Composite	Process Area	ND		
CF2G19-01	Composite	Process Area	2.3		
CF2G19-23	Composite	Process Area	2.2		
CF2G23-01	Composite	Process Area	ND		
CF2G23-23	Composite	Process Area	ND		
CF2G25-01	Composite	Process Area	0.7	CF2G525-01	0.6
CF2G25-23	Composite	Process Area	0.5		
CF2H11-01	Composite	Process Area	19.8	CF2H511-01	20.1
CF2H11-23	Composite	Process Area	12.9		
CF2H12-01	Composite	Process Area	3.8	CF2H512-01	3.5
CF2H12-23	Composite	Process Area	0.7		
CF2H13-01	Composite	Process Area	37.5		
CF2H13-23	Composite	Process Area	20.9		
CF2H14-01	Composite	Process Area	1.8		
CF2H14-23	Composite	Process Area	0.3		
CF2H18-01	Composite	Process Area	1.1	CF2H518-01	1.0
CF2H18-23	Composite	Process Area	ND		
CF2H22-01	Composite	Process Area	40.2	CF2H522-01	35.6
CF2H22-23	Composite	Process Area	30.8		
CF2H24-01	Composite	Process Area	28.9		
CF2H24-23	Composite	Process Area	29.5		
CF2J12-01	Composite	Process Area	1.7		
CF2J12-23	Composite	Process Area	ND		

Table 4-2. PCB Results for Concrete Floor Samples - Second Floor and Penthouses

Sample ID	Sample Type	Area Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CF2J13-01	Composite	Process Area	10.3		
CF2J13-23	Composite	Process Area	11.9		
CF2J14-01	Composite	Process Area	ND		
CF2J14-23	Composite	Process Area	ND		
CF2J19-01	Composite	Process Area	0.5		
CF2J19-23	Composite	Process Area	3.0		
CF2J23-01	Composite	Process Area	1.9		
CF2J23-23	Composite	Process Area	1.3		
CF2J25-01	Composite	Process Area	0.2		
CF2J25-23	Composite	Process Area	ND		
CF2K34-01	Discrete	N/A	ND		
CF2K34-12	Discrete	N/A	ND		
CFP01-01	Discrete	Penthouse	13.5	CFP501-01	11.8
CFP01-12	Discrete	Penthouse	12.1		
CFP02-01	Discrete	Penthouse	7.7		
CFP02-12	Discrete	Penthouse	6.5		
CFP03-01	Discrete	Penthouse	1.2		
CFP03-12	Discrete	Penthouse	2.6		
CFP04-01	Discrete	Penthouse	3.0		
CFP04-12	Discrete	Penthouse	1.0		

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF1A19-01	A	27.8	ND	ND	ND	27.8
CF1A19-01	B	5.4	ND	ND	ND	5.4
CF1A19-01	C	24.1	ND	ND	ND	24.1
CF1A19-01	D	59.4	ND	ND	ND	59.4
CF1B16-01	A	1.2	ND	ND	ND	1.2
CF1B16-01	B	1.4	ND	ND	ND	1.4
CF1B16-01	C	ND	ND	ND	ND	0.0
CF1B16-01	D	ND	ND	ND	ND	0.0
CF1B23-01	A	1.2	ND	ND	ND	1.2
CF1B23-01	B	37.8	ND	ND	ND	37.8
CF1B23-01	C	80.9	ND	ND	ND	80.9
CF1B23-01	D	0.6	ND	ND	ND	0.6
CF1B23-12	A	1.0	ND	ND	ND	1.0
CF1B23-12	B	18.1	ND	ND	ND	18.1
CF1B23-12	C	155.7	ND	ND	ND	155.7
CF1B23-12	D	ND	ND	ND	ND	0.0
CF1B24-12	A	ND	ND	ND	ND	0.0
CF1B24-12	B	3.4	ND	ND	ND	3.4
CF1B24-12	C	70.8	ND	ND	ND	70.8
CF1B24-12	D	0.4	ND	ND	ND	0.4
CF1C22-01	A	7.6	ND	ND	ND	7.6
CF1C22-01	B	1.5	ND	ND	ND	1.5
CF1C22-01	C	39.0	ND	ND	ND	39.0
CF1C22-01	D	8.0	ND	ND	ND	8.0
CF1D10-01	A	ND	ND	ND	ND	0.0
CF1D10-01	B	0.4	ND	ND	ND	0.4
CF1D10-01	C	34.2	ND	ND	ND	34.2
CF1D10-01	D	34.4	ND	ND	ND	34.4
CF1D14-01	A	56.7	ND	ND	ND	56.7
CF1D14-01	B	7.6	ND	ND	ND	7.6
CF1D14-01	C	33.2	ND	ND	ND	33.2
CF1D14-01	D	10.9	ND	ND	ND	10.9
CF1D16-01	A	21.1	ND	ND	ND	21.1
CF1D16-01	B	40.1	ND	ND	ND	40.1
CF1D16-01	C	1.2	ND	ND	ND	1.2
CF1D16-01	D	18.5	ND	ND	ND	18.5
CF1D22-01	A	2.4	ND	ND	ND	2.4
CF1D22-01	B	ND	ND	ND	ND	0.0
CF1D22-01	C	38.7	ND	ND	ND	38.7
CF1D22-01	D	34.1	ND	ND	ND	34.1
CF1D22-23	A	2.3	ND	ND	ND	2.3
CF1D22-23	B	11.1	ND	ND	ND	11.1
CF1D22-23	C	26.6	ND	ND	ND	26.6
CF1D22-23	D	23.1	ND	ND	ND	23.1
CF1D24-23	A	56.9	ND	ND	ND	56.9
CF1D24-23	B	76.5	ND	ND	ND	76.5
CF1D24-23	C	77.5	ND	ND	ND	77.5
CF1D24-23	D	58.8	ND	ND	ND	58.8
CF1E13-01	A	20.9	ND	ND	ND	20.9
CF1E13-01	B	31.8	ND	ND	ND	31.8
CF1E13-01	C	8.3	ND	ND	ND	8.3
CF1E13-01	D	37.0	ND	ND	ND	37.0
CF1E17-01	A	0.8	ND	ND	ND	0.8

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF1E17-01	B	ND	ND	ND	ND	0.0
CF1E17-01	C	ND	ND	ND	ND	0.0
CF1E17-01	D	ND	ND	ND	ND	0.0
CF1E22-01	A	27.4	ND	ND	ND	27.4
CF1E22-01	B	5.1	ND	ND	ND	5.1
CF1E22-01	C	30.3	ND	ND	ND	30.3
CF1E22-01	D	39.9	ND	ND	ND	39.9
CF1F10-01	A	13.5	ND	ND	ND	13.5
CF1F10-01	B	6.8	ND	ND	ND	6.8
CF1F10-01	C	3.5	ND	ND	ND	3.5
CF1F10-01	D	11.3	ND	ND	ND	11.3
CF1F16-01	A	ND	ND	ND	ND	0.0
CF1F16-01	B	42.3	ND	ND	ND	42.3
CF1F16-01	C	ND	ND	ND	ND	0.0
CF1F16-01	D	3.5	ND	ND	ND	3.5
CF1F18-01	A	ND	ND	ND	ND	0.0
CF1F18-01	B	ND	ND	ND	ND	0.0
CF1F18-01	C	46.4	ND	ND	ND	46.4
CF1F18-01	D	58.6	ND	ND	ND	58.6
CF1F22-01	A	20.6	ND	ND	ND	20.6
CF1F22-01	B	9.7	ND	ND	ND	9.7
CF1F22-01	C	15.7	ND	ND	ND	15.7
CF1F22-01	D	50.6	ND	ND	ND	50.6
CF1F22-23	A	7.4	ND	ND	ND	7.4
CF1F22-23	B	5.4	ND	ND	ND	5.4
CF1F22-23	C	7.3	ND	ND	ND	7.3
CF1F22-23	D	42.0	ND	ND	ND	42.0
CF1F23-01	A	35.4	ND	ND	ND	35.4
CF1F23-01	B	11.9	ND	ND	ND	11.9
CF1F23-01	C	48.2	ND	ND	ND	48.2
CF1F23-01	D	59.6	ND	ND	ND	59.6
CF1F23-23	A	26.5	ND	ND	ND	26.5
CF1F23-23	B	2.3	ND	ND	ND	2.3
CF1F23-23	C	55.3	ND	ND	ND	55.3
CF1F23-23	D	79.6	ND	ND	ND	79.6
CF1F24-01	A	132.9	ND	ND	ND	132.9
CF1F24-01	B	40.4	ND	ND	ND	40.4
CF1F24-01	C	19.0	ND	ND	ND	19.0
CF1F24-01	D	4.6	ND	ND	ND	4.6
CF1F28-01	A	25.4	ND	ND	ND	25.4
CF1F28-01	B	33.7	ND	ND	ND	33.7
CF1F28-01	C	1.0	ND	ND	ND	1.0
CF1F28-01	D	4.0	ND	ND	ND	4.0
CF1F28-12	A	9.6	ND	ND	ND	9.6
CF1F28-12	B	28.0	ND	ND	ND	28.0
CF1F28-12	C	0.5	ND	ND	ND	0.5
CF1F28-12	D	1.5	ND	ND	ND	1.5
CF1G15-01	A	0.4	ND	ND	ND	0.4
CF1G15-01	B	66.4	ND	ND	ND	66.4
CF1G15-01	C	0.6	ND	ND	ND	0.6
CF1G15-01	D	33.5	ND	ND	ND	33.5
CF1G23-01	A	2.8	ND	ND	ND	2.8
CF1G23-01	B	ND	ND	ND	ND	0.0

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF1G23-01	C	ND	ND	ND	ND	0.0
CF1G23-01	D	20.1	ND	ND	ND	20.1
CF1G25-01	A	ND	3.5	ND	ND	3.5
CF1G25-01	B	ND	ND	ND	ND	0.0
CF1G25-01	C	ND	ND	ND	ND	0.0
CF1G25-01	D	ND	ND	ND	ND	0.0
CF1G25-23	A	ND	ND	ND	ND	0.0
CF1G25-23	B	ND	ND	ND	ND	0.0
CF1G25-23	C	ND	ND	ND	ND	0.0
CF1G25-23	D	ND	ND	ND	ND	0.0
CF1G29-01	A	2.7	ND	ND	ND	2.7
CF1G29-01	B	54.4	ND	ND	ND	54.4
CF1G29-01	C	121.2	ND	ND	ND	121.2
CF1G29-01	D	2.5	ND	ND	ND	2.5
CF1G29-23	A	1.6	ND	ND	ND	1.6
CF1G29-23	B	65.8	ND	ND	ND	65.8
CF1G29-23	C	75.6	ND	ND	ND	75.6
CF1G29-23	D	1.2	ND	ND	ND	1.2
CF1H10-01	A	17.4	ND	ND	ND	17.4
CF1H10-01	B	51.5	ND	ND	ND	51.5
CF1H10-01	C	87.2	ND	ND	ND	87.2
CF1H10-01	D	33.5	ND	ND	ND	33.5
CF1H10-23	A	18.1	ND	ND	ND	18.1
CF1H10-23	B	45.7	ND	ND	ND	45.7
CF1H10-23	C	68.6	ND	ND	ND	68.6
CF1H10-23	D	20.7	ND	ND	ND	20.7
CF1H12-01	A	49.5	ND	ND	ND	49.5
CF1H12-01	B	30.1	ND	ND	ND	30.1
CF1H12-01	C	46.3	ND	ND	ND	46.3
CF1H12-01	D	36.9	ND	ND	ND	36.9
CF1H12-23	A	15.7	ND	ND	ND	15.7
CF1H12-23	B	24.1	ND	ND	ND	24.1
CF1H12-23	C	36.5	ND	ND	ND	36.5
CF1H12-23	D	16.9	ND	ND	ND	16.9
CF1H16-23	A	75.5	ND	ND	ND	75.5
CF1H16-23	B	12.9	ND	ND	ND	12.9
CF1H16-23	C	74.6	ND	ND	ND	74.6
CF1H16-23	D	78.1	ND	ND	ND	78.1
CF1H18-23	A	0.5	ND	ND	ND	0.5
CF1H18-23	B	20.3	ND	ND	ND	20.3
CF1H18-23	C	21.7	ND	ND	ND	21.7
CF1H18-23	D	88.3	ND	ND	ND	88.3
CF1J09-01	A	74.9	ND	ND	ND	74.9
CF1J09-01	B	40.6	ND	ND	ND	40.6
CF1J09-01	C	21.7	ND	ND	ND	21.7
CF1J09-01	D	34.7	ND	ND	ND	34.7
CF1J09-23	A	3.0	ND	ND	ND	3.0
CF1J09-23	B	0.4	ND	ND	ND	0.4
CF1J09-23	C	23.3	ND	ND	ND	23.3
CF1J09-23	D	51.1	ND	ND	ND	51.1
CF1J10-01	A	38.6	ND	ND	ND	38.6
CF1J10-01	B	14.9	ND	ND	ND	14.9
CF1J10-01	C	17.7	ND	ND	ND	17.7

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF1J10-01	D	26.4	ND	ND	ND	26.4
CF1J10-23	A	43.6	ND	ND	ND	43.6
CF1J10-23	B	12.4	ND	ND	ND	12.4
CF1J10-23	C	7.5	ND	ND	ND	7.5
CF1J10-23	D	13.7	ND	ND	ND	13.7
CF1J13-01	A	7.3	ND	ND	ND	7.3
CF1J13-01	B	16.4	ND	ND	ND	16.4
CF1J13-01	C	20.4	ND	ND	ND	20.4
CF1J13-01	D	7.8	ND	ND	ND	7.8
CF1J13-23	A	6.5	ND	ND	ND	6.5
CF1J13-23	B	15.6	ND	ND	ND	15.6
CF1J13-23	C	16.9	ND	ND	ND	16.9
CF1J13-23	D	7.2	ND	ND	ND	7.2
CF1J15-01	A	30.2	ND	ND	ND	30.2
CF1J15-01	B	58.0	ND	ND	ND	58.0
CF1J15-01	C	41.6	ND	ND	ND	41.6
CF1J15-01	D	140.9	ND	ND	ND	140.9
CF1J17-01	A	63.5	ND	ND	ND	63.5
CF1J17-01	B	4.0	ND	ND	ND	4.0
CF1J17-01	C	2.5	ND	ND	ND	2.5
CF1J17-01	D	17.9	ND	ND	ND	17.9
CF1J35-01	A	ND	9.4	ND	ND	9.4
CF1J35-01	B	ND	3.4	ND	ND	3.4
CF1J35-01	C	ND	4.6	ND	ND	4.6
CF1J35-01	D	ND	17.0	ND	ND	17.0
CF1K09-01	A	19.0	ND	ND	ND	19.0
CF1K09-01	B	13.4	ND	ND	ND	13.4
CF1K09-01	C	17.5	ND	ND	ND	17.5
CF1K09-01	D	16.6	ND	ND	ND	16.6
CF1K09-12	A	1.0	ND	ND	ND	1.0
CF1K09-12	B	18.2	ND	ND	ND	18.2
CF1K09-12	C	20.9	ND	ND	ND	20.9
CF1K09-12	D	16.6	ND	ND	ND	16.6
CF1K10-01	A	20.3	ND	ND	ND	20.3
CF1K10-01	B	2.5	ND	ND	ND	2.5
CF1K10-01	C	27.8	ND	ND	ND	27.8
CF1K10-01	D	23.1	ND	ND	ND	23.1
CF1K10-12	A	38.4	ND	ND	ND	38.4
CF1K10-12	B	0.7	ND	ND	ND	0.7
CF1K10-12	C	28.7	ND	ND	ND	28.7
CF1K10-12	D	36.7	ND	ND	ND	36.7
CF1K12-01	A	14.5	ND	ND	ND	14.5
CF1K12-01	B	52.6	ND	ND	ND	52.6
CF1K12-01	C	78.5	ND	ND	ND	78.5
CF1K12-01	D	29.0	ND	ND	ND	29.0
CF1K12-12	A	28.9	ND	ND	ND	28.9
CF1K12-12	B	29.8	ND	ND	ND	29.8
CF1K12-12	C	42.4	ND	ND	ND	42.4
CF1K12-12	D	28.2	ND	ND	ND	28.2
CF1K14-01	A	33.4	ND	ND	ND	33.4
CF1K14-01	B	52.5	ND	ND	ND	52.5
CF1K14-01	C	13.4	ND	ND	ND	13.4
CF1K14-01	D	44.6	ND	ND	ND	44.6

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF1K14-12	A	42.9	ND	ND	ND	42.9
CF1K14-12	B	47.7	ND	ND	ND	47.7
CF1K14-12	C	39.8	ND	ND	ND	39.8
CF1K14-12	D	14.8	ND	ND	ND	14.8
CF1K15-01	A	7.9	ND	ND	ND	7.9
CF1K15-01	B	35.8	ND	ND	ND	35.8
CF1K15-01	C	56.7	ND	ND	ND	56.7
CF1K15-01	D	7.6	ND	ND	ND	7.6
CF1K15-12	A	0.9	ND	ND	ND	0.9
CF1K15-12	B	34.2	ND	ND	ND	34.2
CF1K15-12	C	66.6	ND	ND	ND	66.6
CF1K15-12	D	1.6	ND	ND	ND	1.6
CF1K16-01	A	43.1	ND	ND	ND	43.1
CF1K16-01	B	52.1	ND	ND	ND	52.1
CF1K16-01	C	68.0	ND	ND	ND	68.0
CF1K16-01	D	58.6	ND	ND	ND	58.6
CF1K18-01	A	45.9	ND	ND	ND	45.9
CF1K18-01	B	1.7	ND	ND	ND	1.7
CF1K18-01	C	0.5	ND	ND	ND	0.5
CF1K18-01	D	63.4	ND	ND	ND	63.4
CF1K18-12	A	25.5	ND	ND	ND	25.5
CF1K18-12	B	0.3	ND	ND	ND	0.3
CF1K18-12	C	0.9	ND	ND	ND	0.9
CF1K18-12	D	52.9	ND	ND	ND	52.9
CF2A19-01	A	ND	ND	ND	ND	0.0
CF2A19-01	B	ND	ND	ND	ND	0.0
CF2A19-01	C	ND	ND	ND	ND	0.0
CF2A19-01	D	ND	ND	ND	ND	0.0
CF2B11-01	A	4.4	ND	ND	ND	4.4
CF2B11-01	B	1.0	ND	ND	ND	1.0
CF2B11-01	C	1.4	ND	ND	ND	1.4
CF2B11-01	D	2.6	ND	ND	ND	2.6
CF2C19-23	A	ND	ND	ND	ND	0.0
CF2C19-23	B	1.9	ND	ND	ND	1.9
CF2C19-23	C	55.8	ND	ND	ND	55.8
CF2C19-23	D	1.2	ND	ND	ND	1.2
CF2D11-01	A	1.5	ND	ND	ND	1.5
CF2D11-01	B	0.7	ND	ND	ND	0.7
CF2D11-01	C	54.2	ND	ND	ND	54.2
CF2D11-01	D	0.6	ND	ND	ND	0.6
CF2D12-01	A	11.1	ND	ND	ND	11.1
CF2D12-01	B	2.0	ND	ND	ND	2.0
CF2D12-01	C	76.7	ND	ND	ND	76.7
CF2D12-01	D	ND	30.8	ND	ND	30.8
CF2D13-01	A	51.2	ND	ND	ND	51.2
CF2D13-01	B	3.9	ND	ND	ND	3.9
CF2D13-01	C	0.4	ND	ND	ND	0.4
CF2D13-01	D	121.7	ND	ND	ND	121.7
CF2D13-23	A	1.8	ND	ND	ND	1.8
CF2D13-23	B	4.2	ND	ND	ND	4.2
CF2D13-23	C	0.5	ND	ND	ND	0.5
CF2D13-23	D	131.4	ND	ND	ND	131.4
CF2D22-01	A	23.0	ND	ND	ND	23.0

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF2D22-01	B	ND	33.7	ND	ND	33.7
CF2D22-01	C	20.9	ND	ND	ND	20.9
CF2D22-01	D	19.5	ND	ND	ND	19.5
CF2D22-23	A	25.7	ND	ND	ND	25.7
CF2D22-23	B	37.5	ND	ND	ND	37.5
CF2D22-23	C	13.7	ND	ND	ND	13.7
CF2D22-23	D	ND	18.6	ND	ND	18.6
CF2D24-01	A	6.2	ND	ND	ND	6.2
CF2D24-01	B	17.1	ND	ND	ND	17.1
CF2D24-01	C	4.9	ND	ND	ND	4.9
CF2D24-01	D	10.5	ND	ND	ND	10.5
CF2E19-01	A	ND	4.8	ND	ND	4.8
CF2E19-01	B	ND	7.6	ND	ND	7.6
CF2E19-01	C	ND	13.2	ND	ND	13.2
CF2E19-01	D	ND	16.5	ND	ND	16.5
CF2E23-01	A	7.9	ND	ND	ND	7.9
CF2E23-01	B	4.3	ND	ND	ND	4.3
CF2E23-01	C	22.8	ND	ND	ND	22.8
CF2E23-01	D	16.6	ND	ND	ND	16.6
CF2F11-01	A	19.4	ND	ND	ND	19.4
CF2F11-01	C	1.8	ND	ND	ND	1.8
CF2F11-01	D	1.7	ND	ND	ND	1.7
CF2F13-01	A	8.2	ND	ND	ND	8.2
CF2F13-01	B	3.1	ND	ND	ND	3.1
CF2F13-01	C	50.6	ND	ND	ND	50.6
CF2F13-01	D	3.9	ND	ND	ND	3.9
CF2F22-01	A	ND	14.2	ND	ND	14.2
CF2F22-01	B	ND	11.1	ND	ND	11.1
CF2F22-01	C	ND	10.2	ND	ND	10.2
CF2F22-01	D	5.8	ND	ND	ND	5.8
CF2F22-23	A	18.8	ND	ND	ND	18.8
CF2F22-23	B	ND	10.3	ND	ND	10.3
CF2F22-23	C	ND	6.1	ND	ND	6.1
CF2F22-23	D	ND	4.4	ND	ND	4.4
CF2F24-01	A	45.3	ND	ND	ND	45.3
CF2F24-01	B	3.7	ND	ND	ND	3.7
CF2F24-01	C	6.0	ND	ND	ND	6.0
CF2F24-01	D	15.9	ND	ND	ND	15.9
CF2H11-01	A	0.7	ND	ND	ND	0.7
CF2H11-01	B	18.0	ND	ND	ND	18.0
CF2H11-01	C	2.2	ND	ND	ND	2.2
CF2H11-01	D	52.5	ND	ND	ND	52.5
CF2H13-01	A	84.0	ND	ND	ND	84.0
CF2H13-01	B	6.6	ND	ND	ND	6.6
CF2H13-01	C	64.6	ND	ND	ND	64.6
CF2H13-01	D	4.2	ND	ND	ND	4.2
CF2H13-23	A	77.9	ND	ND	ND	77.9
CF2H13-23	B	2.0	ND	ND	ND	2.0
CF2H13-23	C	2.2	ND	ND	ND	2.2
CF2H13-23	D	0.6	ND	ND	ND	0.6
CF2H22-01	A	ND	47.4	ND	ND	47.4
CF2H22-01	B	15.5	ND	ND	ND	15.5
CF2H22-01	C	26.7	ND	ND	ND	26.7

Table 4-3. PCB Results for Concrete Aliquot Samples - First and Second Floors

Primary Sample ID	Aliquot ID	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1016	Total PCBs (PPM)
CF2H22-01	D	30.9	ND	ND	ND	30.9
CF2H22-23	A	ND	64.3	ND	ND	64.3
CF2H22-23	B	ND	11.8	ND	ND	11.8
CF2H22-23	C	ND	15.0	ND	ND	15.0
CF2H22-23	D	ND	14.2	ND	ND	14.2
CF2H24-01	A	30.5	ND	ND	ND	30.5
CF2H24-01	B	ND	12.8	ND	ND	12.8
CF2H24-01	C	ND	7.3	ND	ND	7.3
CF2H24-01	D	37.8	ND	ND	ND	37.8
CF2H24-23	A	17.2	ND	ND	ND	17.2
CF2H24-23	B	ND	6.0	ND	ND	6.0
CF2H24-23	C	ND	11.8	ND	ND	11.8
CF2H24-23	D	ND	46.1	ND	ND	46.1

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-4. PCB Results for Concrete Floor Samples - Basement

Sample ID	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CFB01-01	17.4	CFB501-01	14.9
CFB01-12	4.3		
CFB02-01	50.9		
CFB02-12	13.4		
CFB03-01	12.1		
CFB03-12	4.7		
CFB04-01	12.5		
CFB04-12	2.9		
CFB05-01	46.2	CFB505-01	44.9
CFB05-12	10.0		
CFB06-01	26.4		
CFB06-12	2.7		
CFB07-01	19.6		
CFB07-12	4.6		
CFB08-01	60.7		
CFB08-12	87.7		
CFB09-01	9.1		
CFB09-12	2.1		
CFB10-01	79.2	CFB510-01	88.0
CFB10-12	57.2		
CFB11-01	89.6		
CFB11-12	3.5		
CFB12-01	429.3		
CFB12-12	344.6		
CFB13-01	8.5		
CFB13-12	5.5		
CFB14-01	13.1	CFB514-01	11.5
CFB14-12	4.3		
CFB15-01	37.2		
CFB15-12	48.4		
CFB16-01	19.1		
CFB16-12	8.3		
CFB17-01	10.1		
CFB17-12	6.3		
CFB18-01	6.6		
CFB18-12	2.0		
CFB19-01	35.9	CFB519-01	34.9
CFB19-12	5.3		
CFB20-01	ND		
CFB20-12	ND		
CFB21-01	728.2		
CFB21-12	375.4		
CFB22-01	170.1		

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-5. PCB Results for Concrete Column and Wall Samples - Basement

Sample ID	Type	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
CC01-01	Column	1.9		
CC02-01	Column	1.7		
CC03-01	Column	4.4	CC503-01	3.8
CC04-01	Column	5.6		
CC05-01	Column	3.7		
CC06-01	Column	18.8		
CC07-01	Column	1.5		
CC08-01	Column	2.5		
CC09-01	Column	5.8		
CC10-01	Column	2.4		
CC11-01	Column	3.0		
CC12-01	Column	20.4		
CC13-01	Column	16.6	CC513-01	22.1
CC14-01	Column	3.7		
CC15-01	Column	3.1		
CC16-01	Column	14.4		
CC17-01	Column	3.2		
CC18-01	Column	34.4		
CC19-01	Column	9.0		
CC20-01	Column	1.4		
CC21-01	Column	146.6		
CC22-01	Column	7.7		
CW01-01	Wall	0.3		
CW02-01	Wall	0.7		
CW03-01	Wall	3.9		
CW04-01	Wall	15.3		
CW05-01	Wall	21.1		
CW06-01	Wall	7.3		

PPM = parts per million

Table 4-6. PCB Results for Soil Samples - Basement

Sample ID	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
SS010006	5.0		
SS010612	ND		
SS020006	3.2		
SS020612	0.4		
SS030006	ND		
SS030612	ND		
SS040006	ND	SS5040006	ND
SS040612	ND		
SS050006	ND		
SS050612	ND		
SS060006	ND		
SS060612	ND		
SS070006	ND		
SS070612	ND		
SS080006	2.8		
SS080612	ND		
SS090006	ND		
SS090612	ND		
SS100006	0.4	SS5100006	0.4
SS100612	0.4		
SS110006	1.5		
SS110612	ND		
SS120006	ND		
SS120612	1.4		
SS130006	1.6		
SS130612	ND		
SS140006	1.0		
SS140612	ND		
SS150006	8.8	SS5150006	8.4
SS150612	ND		
SS160006	ND		
SS160612	ND		
SS170006	ND		
SS170612	ND		
SS180006	24.5	SS5180006	70.2
SS180612	11.8		
SS190006	33.3		
SS190612	ND		
SS200006	17.9		
SS200612	0.6		
SS210006	16.9		
SS210612	ND		
SS220006	32.2		
SS220612	1.6		
SS230006	277.7	SS5230006	258.5
SS230612	3.6		
SS240006	25.6		
SS240612	ND		
SS250006	23.7		
SS250612	1.6		
SS260006	462.5		
SS260612	1.6		
SS270006	67.7		

Table 4-6. PCB Results for Soil Samples - Basement

Sample ID	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
SS270612	0.4		
SS280006	576.4		
SS280612	28.7		
SS290006	28.6		
SS290612	ND		
SS300006	11.4	SS5300006	15.9
SS300612	9.2		
SS310006	3.9		
SS310612	NS		
SS320006	5.7		
SS320612	ND		
SS330006	ND		
SS330612	2.3		
SS340006	ND		
SS340612	ND		
SS470006	97.0		
SS471218	4.3		
SS480006	132.6		
SS481218	70.7		

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-7. PCB Results for Soil Samples - Outside Building 3

Sample ID	Total PCBs (PPM)	Duplicate ID	Total PCBs (PPM)
SS350006	31.6	SS5350006	12.1
SS353642	2.9		
SS360006	465.8		
SS363642	14.0		
SS370006	390.7		
SS373642	384.2		
SS380006	170.8		
SS383642	29.8		
SS390006	75.8		
SS393642	41.2		
SS400006	36.5	SS5400006	33.0
SS403642	23.9		
SS410006	144.3		
SS413238	5.5		
SS420006	516.8		
SS423137	18.9		
SS430006	449.2		
SS433036	13.1		
SS440006	69.8		
SS443640	3.2		
SS450006	304.2	SS5450006	412.3
SS453642	196.1		
SS460006	64.5		
SS463238	76.9		
SS490006	14.9		
SS493642	1.1		
SS500006	49.5		
SS503844	1.3		
SS510006	295.5		
SS513238	6.9		
SS523336	ND		
SS530006	ND		
SS533036	0.3		

ND = Not detected above method detection limit or reporting limit

PPM = parts per million

Table 4-8. PCB Results for Waste Samples from Chip Chute Waste Pile and Catch Basin

Sample ID	Area	Total PCBs (PPM)
CB010012	Catch Basin	33.9
CB012436	Catch Basin	26.1
CB020012	Catch Basin	13.8
CB022436	Catch Basin	34.0
WP010024	Chip Chute Waste Pile	610.3
WP020024	Chip Chute Waste Pile	98.4
WP030024	Chip Chute Waste Pile	66.8

PPM = parts per million

Table 4-9. PCB Results for Equipment Rinsate Samples

Rinsate ID	Total PCBs (PPM)
CC01-01R	ND
CF1A21-01R	ND
CF1B23-01R	ND
CF1B24-01R	ND
CF1C03-01R	ND
CF1E09-01R	ND
CF1E11-01R	ND
CF1E15-01R	ND
CF1F14-01R	ND
CF1G17-01R	ND
CF1G25-01R	ND
CF1H28-01R	ND
CF1J16-01R	ND
CF1K09-01R	ND
CF2B20-01R	ND
CF2E13-01R	ND
CF2E14-01R	ND
CF2H24-01R	ND
CF2J14-01R	ND
CF2J19-01R	ND
CF2K34-01R	ND
CFB06-01R	ND
CFB15-01R	ND
CFP04-01R	ND
SS050006R	ND
SS160006R	ND
SS240006R	ND
SS310006R	ND
SS410006R	ND
SS53-0006R	ND

ND = Not detected above method detectio limit or reporting limit

PPM = parts per million

Table 4-10. Estimate of TSCA Waste Quantities

Location	Media	Description of PCB Contamination (>43.5 PPM)		TSCA Waste Area (sq. ft)	TSCA Waste Avg. Depth (in.)	TSCA Waste Volume (cu. ft)	TSCA Waste Quantity (tons)	Overage* (tons)	Total TSCA Waste Quantity (tons)
First Floor	Concrete Flooring	21.5 sectors and 27 quadrants within former process and traffic areas	20.5 sectors (8 in.)	8,200	8	5,467	506	0	506
			21 quadrants (8 in.)	2,100	8	1,400	130	43	172
			1 sector (16 in.)	400	16	533	49	62	111
			6 quadrants (16 in.)	600	16	800	74	74	148
Second Floor	Concrete Flooring	3 sectors and 10 quadrants within former process areas	3 sectors (8 in.)	1,200	8	800	74	0	74
			10 quadrants (8 in.)	1,000	8	667	62	20	82
Basement	Concrete Flooring	Elongated area between Rows 20 and 21; area surrounding Sector G11; Sector B17, adjacent to Chip Chute; and small area within Sector B13	Rows 20 - 21	2,800	6	1,400	130	0	130
			Sector B17	400	6	200	19	0	19
			Around Sector G11	1,500	6	750	69	0	69
			Sector B13	200	6	100	9	0	9
Basement	Soil Flooring	5 areas around perimeter (south and west) of concrete floor; also, flooring beneath Chip Chute waste pile	Area A	600	12	600	36	0	36
			Area B	130	12	130	8	0	8
			Area C	160	12	160	10	0	10
			Area D	140	12	140	8	0	8
			Area E	80	12	80	5	0	5
			Chip Chute Flooring	400	36	1,200	72	0	72
Outside, near Chip Chute	Soil, Pavement	Two areas adjacent to Building 3, north of Chip Chute near loading dock; includes asphalt and gravel overlying native soil	Soil and Gravel	2,200	60	11,000	660	0	660
			Asphalt	2,200	4	733	37	0	37
Chip Chute Waste Pile	Waste	20 ft x 20 ft pile of misceallaneous metal shavings and debris, average depth 2 ft	Waste pile	400	24	800	60	0	60
Basement	Concrete Columns	6 oil-stained columns located within areas of concrete flooring contamination	6 columns	230	1	NA	NA	NA	NA
TOTALS							**2,016**	**199**	**2,215**

Notes:

* To prevent the creation of unsupported (cantilevered) floor slabs during removal, saw cut lines will extend beyond the limits of contamination to the nearest support beam or nearest row of vertical columns.

It is not anticpated that TSCA waste soil outside the building will be removed during the upcoming remedial action. Thus, total TSCA waste quantity for the remedial action is estimated to be 1,518 tons.

PCB-contaminated concrete columns will not be removed; rather, contaminated portions of the columns will be cleaned using a chemical washing process (refer to RA Work Plan).

Table 4-11. Results of Removal Action Waste Pre-Determination Sampling - TCLP Metals and SVOCs

Sample ID	Media	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	SVOCs
CF1C23-01C	Concrete	ND	0.64	ND	0.03	ND	ND	ND	ND	ND
SS230018	Soil	ND	0.39	0.07	ND	0.16	ND	ND	ND	ND
SS430036	Soil	0.22	1.2	ND	ND	ND	ND	ND	ND	ND
CB020012	Waste	0.20	0.23	ND	ND	0.17	ND	ND	ND	ND
WP020024	Waste	0.15	0.61	ND	ND	ND	ND	ND	ND	ND
TCLP Limit		**5**	**100**	**1**	**5**	**5**	**5.7**	**5**	**0.2**	**---**

Notes: All units are mg/L.

ND = Not detected above method detection limit or reporting limit

SVOCs = Semivolatile organic compounds

TCLP = Toxicity Characteristic Leaching Procedure

Table 4-12. Results of Removal Action Waste Pre-Determination Sampling - GROs, DROs, VOCs

Sample ID	Media	Units	DROs	GROs	VOCs
CF1C23-01C	Concrete	mg/kg	413	---	---
SS230018	Soil	mg/kg	53	---	---
SS403640	Soil	mg/kg	325	ND	---
SS430036	Soil	mg/kg	188	ND	---
CB020012	Waste	mg/kg	723	ND	---
WP020024	Waste	mg/kg	1122	ND	---
SS45L	Groundwater	mg/L	5.57	ND	ND

ND = Not detected above method detection limit or reporting limit

DROs = Diesel range organics

GROs = Gasoline range organics

VOCs = Volatile organic compounds

Table 4-13. Results of Health and Safety Pre-Assessment Sampling - Total Metals

Sample ID	Media	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	Hg
CF1C23-01C	Concrete	4,336	ND	2.1	54.9	0.22	ND	73,133	79.9	4.1	11.7	8,975	8.6	2,414	130	10.0	668	1.05	ND	286	ND	13.0	26.5	ND
CF1D24-01B	Concrete	4,106	ND	2.7	59.3	0.25	ND	68,230	118.0	3.6	43.7	8,951	10.2	2,148	109	11.5	793	ND	ND	488	ND	12.9	32.4	ND
CF1D40-01	Concrete	5,567	ND	2.5	45.2	ND	ND	94,282	58.1	4.5	4.2	9,075	5.6	3,121	150	11.3	523	0.08	ND	413	ND	17.9	28.9	ND
CF1D40-12	Concrete	5,063	ND	2.5	49.3	0.26	ND	82,126	135.0	5.8	8.7	10,732	4.2	3,061	134	11.7	567	0.12	ND	423	ND	16.6	35.9	ND
CF1E23-01B	Concrete	4,231	ND	4.0	71.2	0.25	ND	69,422	143.0	4.7	5.5	10,565	7.1	2,130	230	12.8	777	1.04	ND	352	ND	15.1	32.7	ND
CF2C35-01	Concrete	5,766	ND	2.9	54.8	0.27	ND	91,441	74.6	4.1	5.4	10,091	5.7	3,373	124	11.3	ND	0.05	ND	382	ND	16.2	67	ND
CF2C35-12	Concrete	3,869	ND	2.5	52.5	0.20	ND	58,884	135	3.6	5.4	8,275	5.1	1,798	130	10.4	603	0.06	ND	368	4	12.3	27.2	ND
SS230018	Soil	8,028	ND	9.5	62.9	0.58	24.7	7,612	43.4	36.7	144	24,967	222	1,516	241	29.4	669	ND	9.67	398	5.35	33.2	83.9	0.68
SS340018	Soil	8,430	ND	3.3	94.9	0.53	ND	3,821	18.1	9.2	8.1	12,899	22.0	1,971	413	14.5	328	0.26	ND	803	ND	28.9	28.2	0.06
SS430036	Soil	2,795	ND	21.1	67.0	ND	3.9	90,811	206	25.4	370	196,400	116	16,874	1728	203	ND	0.09	ND	188	79.9	21.7	289	ND
CB020012	Waste	1,364	ND	1.7	27.7	0.12	0.3	6,152	9.5	3.1	25.7	4,797	70.0	705	118	7.8	175	0.01	ND	30.7	ND	5.3	37.1	ND
WP020024	Waste	2,942	ND	5.3	101.0	ND	7.9	24,933	410	38.0	2,142	317,530	351	1,658	2,931	335	ND	ND	ND	194	115	27.0	958	ND

Notes: All units are mg/kg.

ND = Not detected above method detection limit or reporting limit

Table 4-14. Results of Health and Safety Pre-Assessment Sampling - Total SVOCs

Sample ID	Media	2-Methyl-Naphthalene	2-Nitro-phenol	Acenaphthene	Anthracene	Benzo(a)-anthracene	Benzo(a)-pyrene	Benzo(b)-fluoranthene	Benzo(g,h,i)-perylene	Benzo(k)-fluoranthene	Carbazole	Chrysene	Dibenz(a,h)-anthracene	Dibenzo-furan
CF1C23-01C	Concrete	4.0	ND	4.2	1.9	2.0	ND	ND	ND	ND	ND	4.7	ND	4.7
CF1D24-01B	Concrete	3.6	ND	5.5	3.9	3.2	ND	ND	1.1	ND	0.27	3.8	ND	6.5
CF1D40-01	Concrete	0.23	ND	0.64	1.2	4.0	2.0	4.1	1.3	1.3	0.30	4.0	0.46	1.1
CF1D40-12	Concrete	0.12	ND	0.34	0.11	0.95	0.70	1.1	0.44	0.50	0.13	1.4	0.17	1.0
CF1E23-01B	Concrete	ND	ND	10.2	16.7	0.38	ND	ND	ND	ND	ND	1.9	ND	10.8
CF2C35-01	Concrete	ND	ND	0.19	ND	0.41	0.26	0.35	0.20	0.24	ND	0.62	ND	0.59
CF2C35-12	Concrete	ND	0.98	0.32	0.46	1.5	0.67	1.0	0.47	0.50	0.15	1.5	0.14	0.63
SS230018	Soil	ND	ND	ND	ND	1.1	1.2	ND	1.2	ND	ND	2.1	ND	ND
SS340018	Soil	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS430036	Soil	ND	ND	0.18	0.11	1.1	0.42	0.75	0.25	0.34	ND	1.1	ND	ND
CB020012	Waste	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	1.7	ND	ND
WP020024	Waste	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	0.15	ND	ND

Notes: All units are mg/kg.

ND = Not detected above method detection limit or reporting limit

SVOCs = Semivolatile organic compounds

Table 4-14. Results of Health and Safety Pre-Assessment Sampling - Total SVOCs

Sample ID	Di-n-butyl-phthalate	Fluoranthene	Fluorene	Ideno(1,2,3-cd)-pyrene	Isophorone	Naphthalene	Pentachloro-phenol	Phenanthrene	Pyrene
CF1C23-01C	ND	9.9	2.9	ND	17.2	5.0	ND	10.1	10.0
CF1D24-01B	ND	16.0	3.4	ND	7.9	2.7	ND	18.4	13.8
CF1D40-01	ND	12.0	0.13	2.3	35.4	0.20	ND	8.5	7.2
CF1D40-12	ND	4.1	ND	0.59	40.4	ND	ND	4.5	2.7
CF1E23-01B	ND	11.6	5.2	ND	29.7	10.1	ND	ND	6.7
CF2C35-01	0.32	2.1	ND	0.32	29.1	ND	ND	2.4	1.2
CF2C35-12	ND	6.5	ND	0.91	17.4	ND	ND	5.3	3.0
SS230018	ND	5.0	ND	2.7	ND	ND	ND	ND	3.4
SS340018	ND	ND	ND	ND	ND	ND	ND	ND	ND
SS430036	ND	4.3	ND	0.39	ND	ND	0.42	0.45	3.2
CB020012	ND	1.5	ND	ND	ND	ND	ND	ND	0.56
WP020024	ND	0.27	ND	ND	ND	ND	ND	0.10	0.25

Table 4-15. Results of IDW Sampling - PCBs

Sample ID	Media	Units	PCBs
IDW-01	Water	mg/L	ND
IDW-02	Water	mg/L	ND
IDW-03	Water	mg/L	ND
IDW-04	Water	mg/L	ND
IDW-05	Absorbent	mg/kg	1.356

ND = Not detected above MDL or RL

Table 4-16. Results of IDW Sampling - Total and TCLP Metals

Sample ID	Media	Units	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	Hg
Total Metals:																									
IDW-01	Water	mg/L	199	0.025	0.05	3.1	0.0104	ND	4,585	0.59	29.9	0.65	308	8.9	142	6.3	0.69	38.6	ND	ND	55.2	0.0026	0.31	2.4	0.00045
IDW-02	Water	mg/L	173	0.037	0.042	2.8	0.008	ND	3,988	0.51	31.8	0.92	267	1.7	135	5.6	0.57	36.7	ND	ND	57.8	ND	0.26	2.1	0.00033
IDW-03	Water	mg/L	46.1	0.005	0.015	0.79	0.002	ND	736	0.27	3.9	33.6	58.2	0.08	26.9	1.0	0.12	19.5	ND	ND	89.8	0.0027	0.09	0.48	0.00042
IDW-04	Water	mg/L	105	0.13	0.023	1.6	0.0047	ND	1,479	0.70	10.4	93.4	137	0.13	64.6	2.6	0.25	23.5	ND	ND	121	ND	0.19	1.2	0.00026
***MSD Limit**		**mg/L**		**0.5**	**0.4**	**10**	**0.4**	**0.7**		**5**		**2.7**	**150**	**0.4**			**2.3**		**0.2**	**0.5**				**3.0**	**0.01**
TCLP Metals:																									
IDW-05	Absorbent	mg/L			0.15	0.12		ND		ND				ND					ND	ND					ND
TCLP Limit		**mg/L**			**5**	**100**		**1**		**5**				**5**					**5.7**	**5**					**0.2**

Follow-Up Sampling (September 6, 2001):

Sample ID	Media	Units	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	Hg
Total Metals:																									
IDW-06	Water	mg/L	0.79	ND	ND	0.19	ND	ND	108	0.02	0.01	0.08	0.23	ND	ND	ND	ND	26.3	0.1	ND	104	0.0444	ND	0.68	ND
IDW-07	Water	mg/L	0.24	ND	ND	0.81	ND	ND	432	0.02	0.0	ND	0.34	ND	ND	ND	ND	39.4	0.1	ND	45.1	ND	ND	1.57	ND
***MSD Limit**		**mg/L**		**0.5**	**0.4**	**10**	**0.4**	**0.7**		**5**		**2.7**	**150**	**0.4**			**2.3**		**0.2**	**0.5**				**3.0**	**0.01**

Notes: * St. Louis Metropolitan Sewer District discharge limits.

ND = Not detected above method detection limit or reporting limit

Table 4-17. Results of IDW Sampling - Total and TCLP SVOCs

Sample ID	Media	Units	2-Methyl-naphthalene	4-Chlor-3-methylphenol	Acenaphthene	Anthracene	Dibenzofuran	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Phenol	Pyrene	Heptane
Total SVOCs:														
IDW-01	Water	ug/L	20.8	ND	19.3	67.1	24.9	17.1	5.93	67.1	65.1	378	7.78	ND
IDW-02	Water	ug/L	6.94	ND	6.57	ND	9.21	7.52	ND	12.2	31.6	347	ND	ND
IDW-03	Water	ug/L	6.87	ND	5.41	ND	7.69	ND	ND	18.8	22.7	73.2	ND	ND
IDW-04	Water	ug/L	13.1	7.31	12	ND	13.9	5.46	ND	44.4	28	71.2	ND	ND
MSD Limit*		**ug/L**										**7000**		
TCLP SVOCs:														
IDW-05	Absorbent	mg/L	SVOCs - ND											---

Notes:

* St. Louis Metropolitan Sewer District discharge limits.

St. Louis Metropolitan Sewer District discharge limit for Total Toxic Organics - 5,520 ug/L.

ND = Not detected above MDL or RL

SVOCs = Semivolatile organic compounds

TCLP = Toxicity Characteristic Leaching Procedure

Table 4-18. Results of Air Sampling

Sample ID	Type	Operation	Respirable Dust (mg)	Quarts (mg)	Cristobalite (mg)	Tridymite (mg)	Respirable Dust (mg/m3)	Quartz (mg/m3)	Cristobalite (mg/m3)	Tridymite (mg/m3)
AREA062101	Area	Concrete Saw Cutting	3.32	ND	ND	ND	2.34	<0.007	<0.01	<0.01
PERS062201	Personal	Concrete Pulverizer	1.98	ND	ND	ND	3.67	<0.02	<0.04	<0.04
PER062301	Personal	Sample Weigh and Pack	ND	ND	ND	ND	<0.05	<0.02	<0.05	<0.05
AREA062501	Area	Concrete Coring	0.04	ND	ND	ND	0.05	<0.01	<0.02	<0.02
PERS062701	Personal	Concrete Drilling	3.92	0.01	ND	ND	7.13	0.02	<0.04	<0.04

ND = Not detected above MDL or RL

LPM = Liters per minute

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1	K24	A	2.75
1		B	2.5
1		C	2.5
1		D	2.375
1	K22	A	2.25
1		B	3
1		C	3
1		D	2.25
1	K20	A	2
1		B	2.75
1		C	3
1		D	2.25
1	K18	A	2.25
1		B	3.25
1		C	4
1		D	2.25
1	K16	A	1.5
1		B	1.75
1		C	1.5
1		D	1.625
1	K14	A	2
1		B	2
1		C	2
1		D	1.75
1	K12	A	1
1		B	1.5
1		C	1.5
1		D	1.25
1	K10	A	1.5
1		B	2
1		C	1.5
1		D	1.5
1	K08	A	2.25
1		B	2.25
1		C	2.25
1		D	2.5
1	J25	A	2.25
1		B	2.25
1		C	2
1		D	2.25
1	J23	A	2.25
1		B	2.25
1		C	2
1		D	2
1	J21	A	1.75
1		B	2
1		C	1.75
1		D	2
1	J19	A	2
1		B	2
1		C	2.5
1		D	2.25
1	J17	A	2
1		B	1.75
1		C	1.75
1		D	2
1	J15	A	1
1		B	1

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1		C	1.25
1		D	1.5
1	J13	A	2
1		B	2
1		C	2
1		D	2
1	J11	A	1.75
1		B	1.5
1		C	1.875
1		D	1.5
1	J09	C	2
1		D	1.75
1	H32	A	2
1		B	2.25
1		C	2.25
1		D	2
1	H30	A	3
1		B	3
1		C	2.25
1		D	3.25
1	H28	A	4
1		B	2.75
1		C	2.375
1		D	2.25
1	H24	A	2
1		B	2.125
1		C	2.25
1		D	2
1	H22	A	2.75
1		B	2.25
1		C	2.25
1		D	2.25
1	H18	A	2
1		B	2
1		C	2
1		D	2
1	H16	A	1.75
1		B	1.5
1		C	1.5
1		D	2
1	H14	A	2.25
1		B	1.75
1		C	2
1		D	2.25
1	H12	A	1.5
1		B	1.5
1		C	2
1		D	1.5
1	H10	A	1.75
1		B	2
1		C	2.25
1		D	2
1	H08	A	2.5
1		B	2.25
1		C	2.75
1		D	2.5
1		B	0.25
1	G31	A	3

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1		B	2.75
1		C	2.25
1		D	2.25
1	G29	A	2
1		B	2
1		C	2.5
1		D	2
1	G27	A	2.25
1		B	3.25
1		C	3
1		D	4
1	G25	A	2
1		B	2.75
1		C	2.5
1		D	2.25
1	G23	A	2
1		B	2.5
1		C	2.75
1		D	1.75
1	G19	A	3
1		B	2.5
1		C	2.5
1		D	2
1	G17	A	2.5
1		B	2.75
1		C	2.75
1		D	2.25
1	G15	A	2.5
1		B	2.5
1		C	3.5
1		D	2
1	G13	A	2
1		B	2.5
1		C	3
1		D	2
1	G11	A	1.75
1		B	3.25
1		C	2.75
1		D	2
1	G09	A	2
1		B	2
1		C	2.5
1		D	2
1	G03	A	2
1		B	2.25
1		C	2.75
1		D	2.25
1	F32	A	2.25
1		B	2.5
1		C	2.25
1		D	1.625
1	F30	A	2.25
1		B	2.25
1		C	2
1		D	4.75
1	F28	A	2.25
1		B	1.75
1		C	2

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1		D	4
1	F24	A	2.5
1		B	2.25
1		C	2.25
1		D	2.75
1	F18	A	2
1		B	2.25
1		C	2.25
1		D	2
1	F16	A	2.5
1		B	2
1		C	2.75
1		D	2.25
1	F12	A	1.75
1		B	2
1		C	2
1		D	2
1	F10	A	2.5
1		B	1.75
1		C	1.75
1		D	2
1	F08	A	2
1		B	2.5
1		C	2.5
1		D	2.25
1	E25	A	2.25
1		B	2
1		C	2.25
1		D	1.625
1	E23	A	2
1		B	2.25
1		C	1.75
1		D	2
1	E19	A	1.75
1		B	2.25
1		C	2
1		D	1.75
1	E17	A	2
1		B	2.25
1		C	2.25
1		D	2.25
1	E15	A	2
1		B	2.25
1		C	2.25
1		D	2
1	E13	A	2.25
1		B	1.75
1		C	1.5
1		D	2
1	E11	A	2
1		B	1.875
1		C	2
1		D	1.875
1	E09	A	2.25
1		B	2.5
1		C	1.75
1		D	2
1	E03	A	2.5

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1		B	2
1		C	2.5
1		D	2
1	D24	A	2
1		B	2.25
1		C	2
1		D	2.25
1	D22	A	1.75
1		B	1.75
1		C	2
1		D	1.5
1	D18	A	2 1/2
1		B	2 3/4
1		C	2 1/2
1		D	2 1/2
1	D16	A	1.75
1		B	3
1		C	2.25
1		D	2
1	D14	A	2.5
1		B	2.25
1		C	2.5
1		D	2.25
1	D12	A	1.5
1		B	1.5
1		C	1.875
1		D	1.5
1	D10	A	1.75
1		B	1.75
1		C	1.75
1		D	2
1	D08	A	3.5
1		B	3
1		C	3
1		D	3.75
1	C25	A	2.25
1		B	1.75
1		C	2
1		D	1.75
1	C23	A	1.75
1		B	2.25
1		C	2.5
1		D	2.25
1	C19	A	2.625
1		B	2.25
1		C	2.25
1		D	2.25
1	C17	A	2.25
1		B	2.25
1		C	2.25
1		D	1.75
1	C15	A	2.25
1		B	2.25
1		C	2
1		D	2
1	C13	A	2.25
1		B	1.75
1		C	1.75

Table 4-19. Concrete Cap Thickness - First Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
1		D	2.25
1	C11	A	1.75
1		B	1.75
1		C	1.5
1		D	2
1	C09	A	2.5
1		B	2
1		C	2
1		D	2.75
1	C03	C	3
1		D	2.75
1	B28	A	2.25
1		B	2.5
1		C	1.75
1		D	2
1	B26	A	2
1		B	2.25
1		C	1.75
1		D	2.5
1	B24	A	2.75
1		B	2.75
1		C	2.25
1		D	3
1	B20	A	2.5
1		B	2.5
1		C	2.5
1		D	3.25
1	B18	A	2.5
1		B	2
1		C	2
1		D	2.75
1	B16	A	3
1		B	2.25
1		C	2.25
1		D	3
1	B10	A	2.75
1		B	2.25
1		C	2.25
1		D	2.75
1	B08	A	1.75
1		B	2.25
1		C	2
1		D	2.5
1	B06	A	2
1		B	2.75
1		C	2.5
1		D	2.25
1	B04	A	2.5
1		C	2.25
1		D	3
AVG.			**2.2**

Table 4-20. Concrete Cap Thickness - Second Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
2	F24	A	3.25
2		B	3
2		C	3
2		D	2.5
2	F22	A	2.75
2		B	2.75
2		C	3
2		D	2.75
2	F18	A	2.75
2		B	3
2		C	2.75
2		D	2.75
2	F13	A	2.5
2		B	2.75
2		C	2.5
2		D	2.5
2	F11	A	3.75
2		B	3.25
2		C	3
2		D	2.75
2	F09	A	3
2		B	3.5
2		C	3.25
2		D	3
2	E25	A	2.25
2		B	2.75
2		C	2.5
2		D	2.25
2	E23	A	2.5
2		B	2.25
2		C	2.75
2		D	2.75
2	E19	A	2.5
2		B	2.5
2		C	2.75
2		D	2.75
2	E14	A	2.75
2		B	2.75
2		C	3
2		D	3
2	E12	A	3
2		B	3.25
2		C	3
2		D	2.75
2	E10	A	2.5
2		B	3
2		C	2.5
2		D	2.25
2	D24	A	2.5
2		B	3
2		C	2.5
2		D	2.5
2	D22	A	2.5
2		B	2.25
2		C	2.5
2		D	2.75
2	D18	A	3
2		B	3

Table 4-20. Concrete Cap Thickness - Second Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
2		C	3
2		D	3
2	D13	A	2.25
2		B	2.25
2		C	2.5
2		D	3
2	D11	A	3.75
2		B	3.25
2		C	2.75
2		D	2.75
2	D09	A	2.75
2		B	3.25
2		C	3.5
2		D	3.25
2	C25	A	3
2		B	2.5
2		C	3
2		D	3.25
2	C23	A	3
2		B	2.75
2		C	2
2		D	2.75
2	C19	A	3
2		B	2.75
2		C	2.75
2		D	2.75
2	C14	A	2.75
2		B	3
2		C	2.75
2		D	3
2	C12	A	3
2		B	2.75
2		C	3.5
2		D	3
2	C10	A	3
2		B	3
2		C	2.5
2		D	2.5
2	B24	A	2.75
2		B	3
2		C	2.75
2		D	3.25
2	B22	A	2.75
2		B	2.25
2		C	2.75
2		D	2.75
2	B20	A	2.75
2		B	2.75
2		C	3
2		D	2.75
2	B18	A	3
2		B	3.5
2		C	3.5
2		D	3.25
2	B13	A	3
2		B	3.25
2		C	3.25
2		D	3.25

Table 4-20. Concrete Cap Thickness - Second Floor

Floor	Sector	Quadrant	Cap Thickness (in.)
2	B11	A	3.25
2		B	3.75
2		C	2.75
2		D	1
2	B09	A	3.25
2		B	3
2		C	3
2		D	2.25
AVG.			**2.8**

FIGURES

0 1
SCALE IN MILES
N

Source: USGS Clayton, Missouri 7.5' x 15' Quadrangle
aerial photography, flight date 1998.

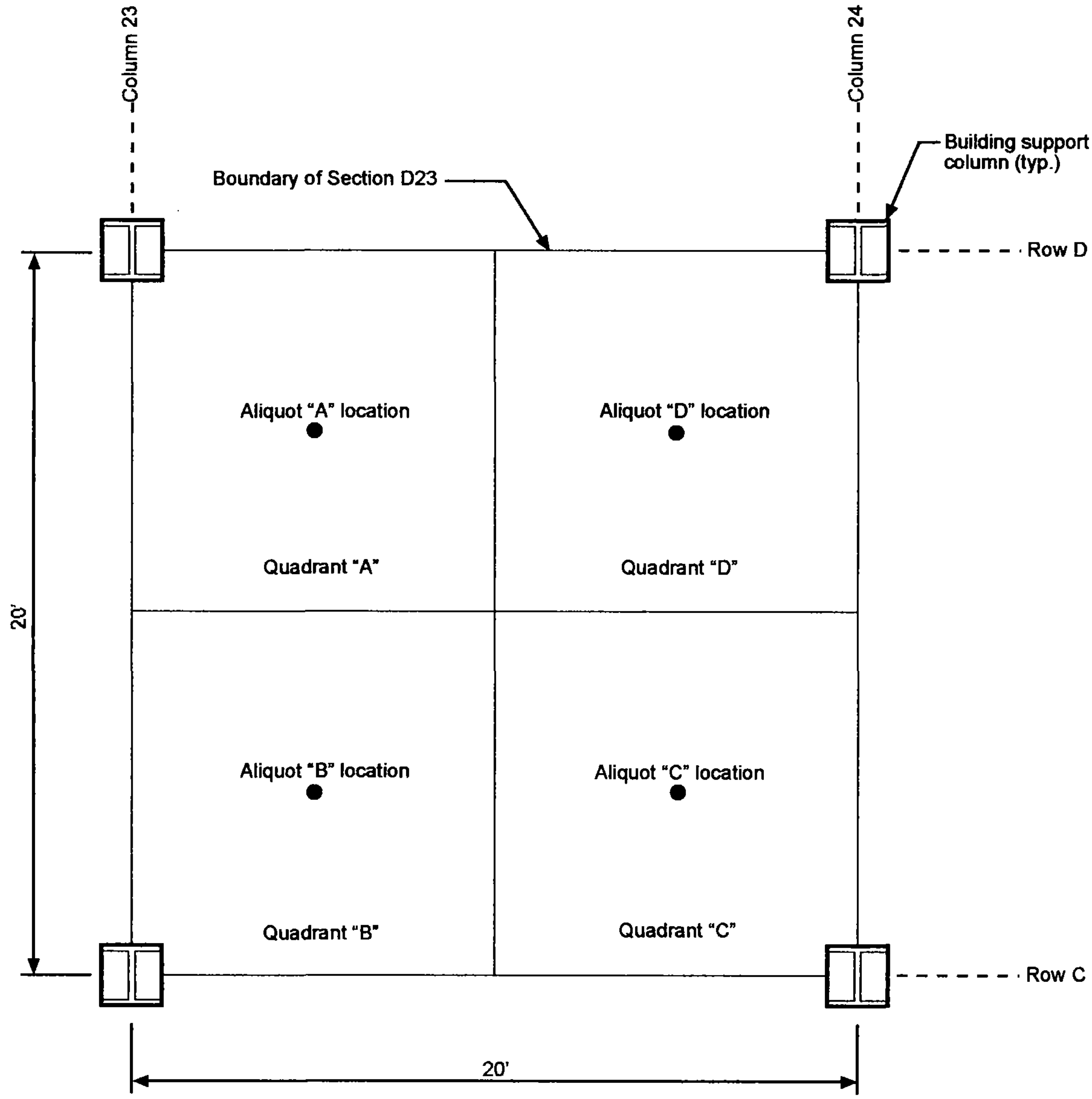
St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 1-1
Site Location Map

Arrowhead Contracting, Inc.

Date: 8/31/01	Project No.: 00-215 SLAAP Building 3	Checked By: GWW	Drawn By: DLR

S:\ACI Environme jects\SLAAP\Figures\Site Location Map.fh10 8/7/01 dlr

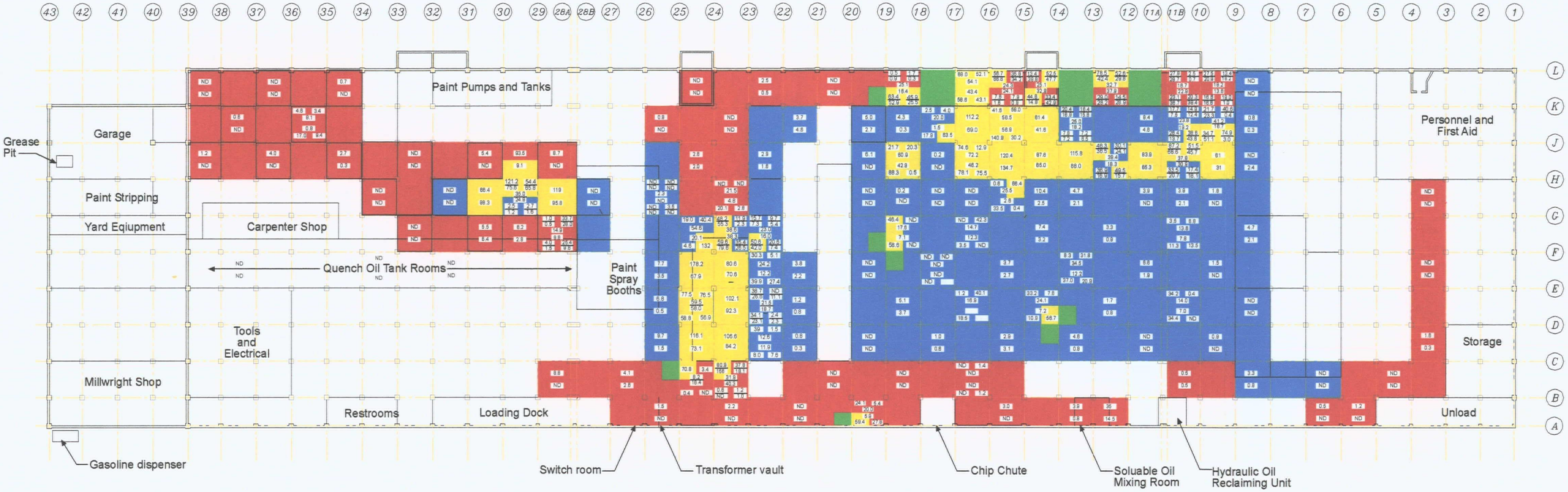


St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 1-2
Example Schematic of Sample Location and Nomenclature

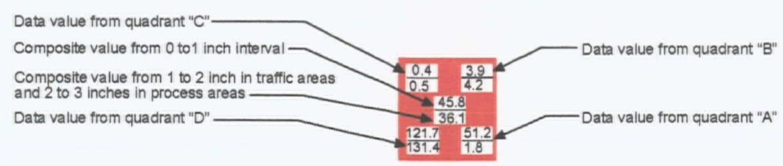
Arrowhead Contracting, Inc.

Date: 8/31/01	Project No.: 00-215 SLAAP Building 3	Checked By: GBK	Drawn By: DLR



Legend

- Former traffic area
- Former process area
- Sectors with PCB contamination above 43.5 ppm
- Areas selected for sampling to fill data gaps



Note:

Single value or uppermost value for each quadrant represents 0-1 inch interval. Lower most value for each quadrant represents 1-2 inch interval in traffic areas and 2-3 inch interval for process areas.

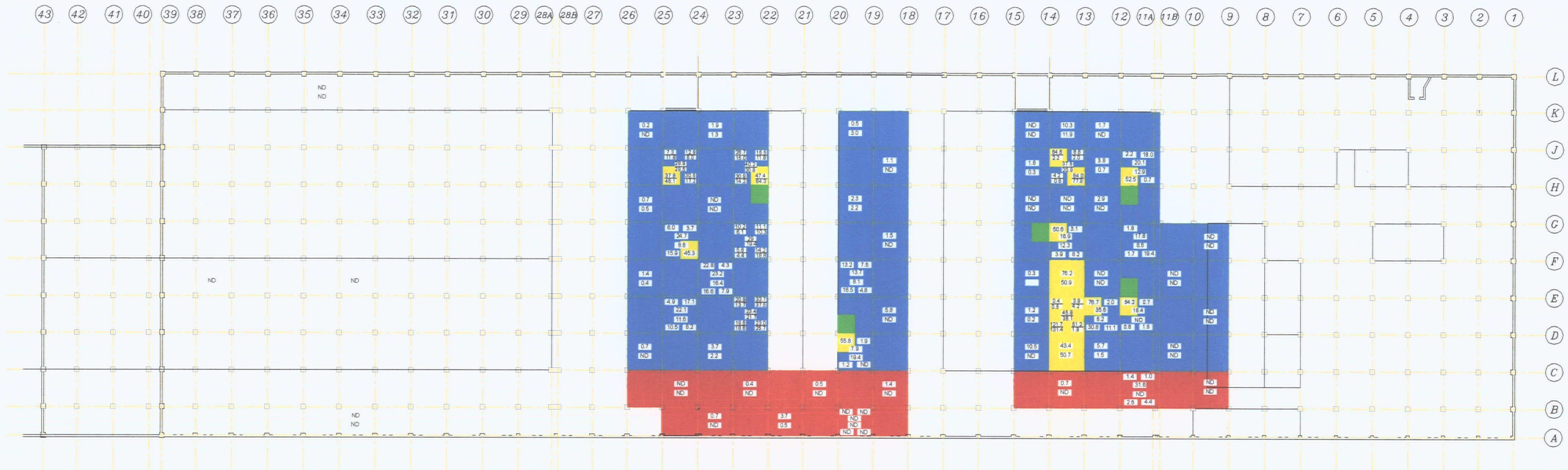
0 40 80
SCALE IN FEET

St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 2-1
Sample Locations
and PCB Results for First Floor

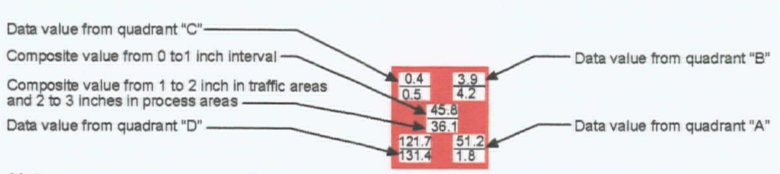
Arrowhead Contracting, Inc.

Date: 8/31/01 | Project No.: 00-215 SLAAP Building 3 | Checked By: GWW | Drawn By: DLR



Legend

Red	Former traffic area
Blue	Former process area
Yellow	Sectors with PCB contamination above 43.5 ppm
Green	Areas selected for sampling to fill data gaps



Note:

Single value or uppermost value for each quadrant represents 0-1 inch interval. Lower most value for each quadrant represents 1-2 inch interval in traffic areas and 2-3 inch interval for process areas.

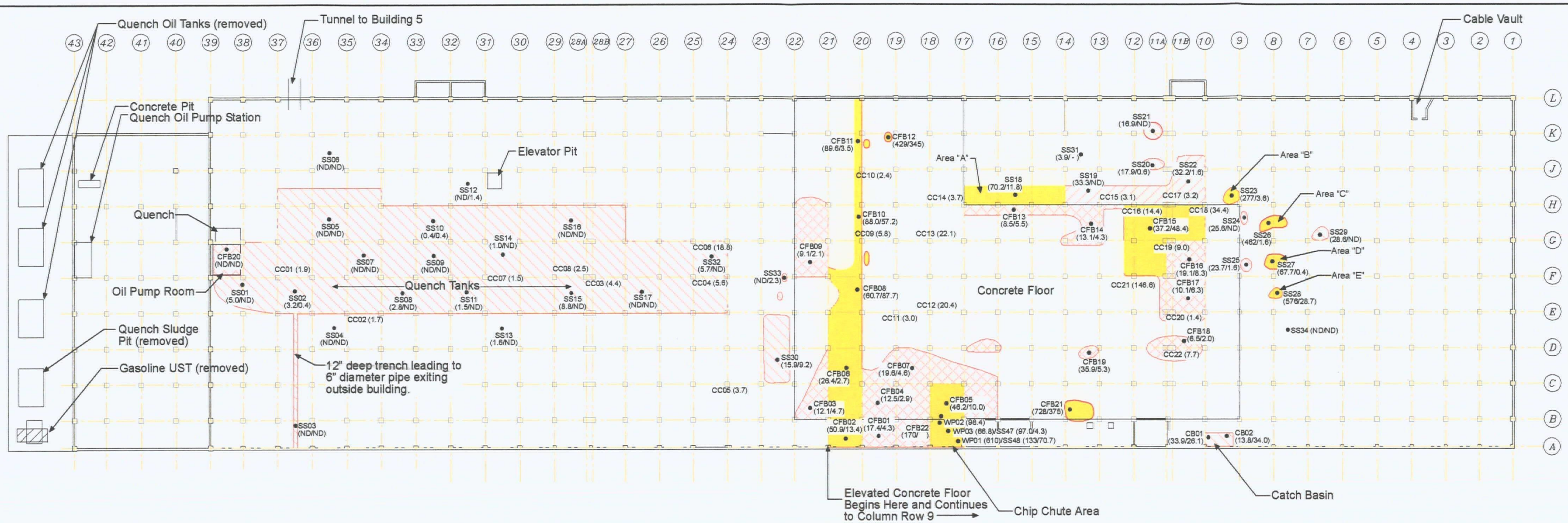
0 40 80
SCALE IN FEET

St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 2-2
Sample Locations
and PCB Results for Second Floor

Arrowhead Contracting, Inc.

Date: 8/31/01	Project No.: 00-215 SLAAP Building 3	Checked By: GWW	Drawn By: DLR



Column	Sample ID	Sample Collected at Base or Column	Stained Column Area (sq. ft)	Stained Column Base Area (sq. ft)	Dimension of Column Base	Column Height	Column Shape
F37	CC01	Base	68	156	12.5 X 12.5	5.7'	Rectangle
E35	CC02	Base	25	150	12.5 X 12.5	5.7'	Rectangle
F28	CC03	Base	80	156	12.5 X 12.5	5.7'	Trapezoid
F25	CC04	Column	68	156	12.5 X 12.5	5.7'	Rectangle
C24	CC05	Column	34	36	12.5 X 12.5	5.7'	Rectangle
G25	CC06	Column	4	150	12.5 X 12.5	5.7'	Rectangle
F31	CC07	Column	68	70	12.5 X 12.5	5.7'	Rectangle
F29	CC08	Column	68	156	12.5 X 12.5	5.7'	Rectangle
G20	CC09	Column	42	N/A	N/A	7.3'	Rectangle
E18	CC12	Column	24	16	8 X 8	4.3'	Rectangle
G18	CC13	Column	36	6	8 X 8	4.3'	Rectangle
H17	CC14	Column	24	32	10 X 10'	4.3'	Trapezoid
H13	CC15	Base	24	85	10 X 10	4.3'	Trapezoid
H12	CC16	Base	36	90	10 X 10	4.3'	Trapezoid
H11	CC17	Base	50	100	10 X 10	4.3'	Trapezoid
H10	CC18	Base	12	25	10 X 10	4.3'	Trapezoid
G11	CC19	Column	12	27	8 X 8	4.3'	Rectangle
E11	CC20	Column	20	20	8 X 8	4.3'	Rectangle
F12	CC21	Column	4	12	8 X 8	4.3'	Rectangle
D11	CC22	Column	20	60	8 X 8	4.3'	Rectangle
F36			68	156	12.5 X 12.5	5.7'	Rectangle
E36			68	150	12.5 X 12.5	5.7'	Rectangle
F35			25	80	12.5 X 12.5	5.7'	Rectangle
F34			17	120	12.5 X 12.5	5.7'	Rectangle
E34			68	140	12.5 X 12.5	5.7'	Rectangle
F33			41	156	12.5 X 12.5	5.7'	Rectangle
F32			50	68	12.5 X 12.5	5.7'	Rectangle
E32			20	68	12.5 X 12.5	5.7'	Rectangle
E31			41	120	12.5 X 12.5	5.7'	Rectangle
F27			0	4	12.5 X 12.5	5.7'	Rectangle
F23			41	75	12.5 X 12.5	5.7'	Rectangle
D24			0	36	12.5 X 12.5	5.7'	Rectangle
G24			34	75	12.5 X 12.5	5.7'	Rectangle
K22			34	120	8 X 8	4.3'	Rectangle
H15			12	25	10 X 10	4.3'	Rectangle
H14			12	32	10 X 10	4.3'	Rectangle
J11			8	32	8 X 8	4.3'	Rectangle
C18			0	30	8 X 8	4.3'	Rectangle
B18			0	64	8 X 8	4.3'	Rectangle
B13			12	24	8 X 8	4.3'	Rectangle
	Totals:		1418	3230			

Legend

● SS07 (14.5/10.5)	Discrete soil sampling location with PCB concentration shown in parts per million (0-6 inches/12-18 inches).
● CFB02 (2.2)	Concrete floor sampling location with PCB concentration shown in parts per million.
CC02 (1.7)	Concrete column sampling location with PCB contamination shown in parts per million.
	Stained soil areas
	Stained concrete floor areas
	Stained areas with PCB concentrations above 43.5 ppm scheduled for removal.

0 40 80
SCALE IN FEET

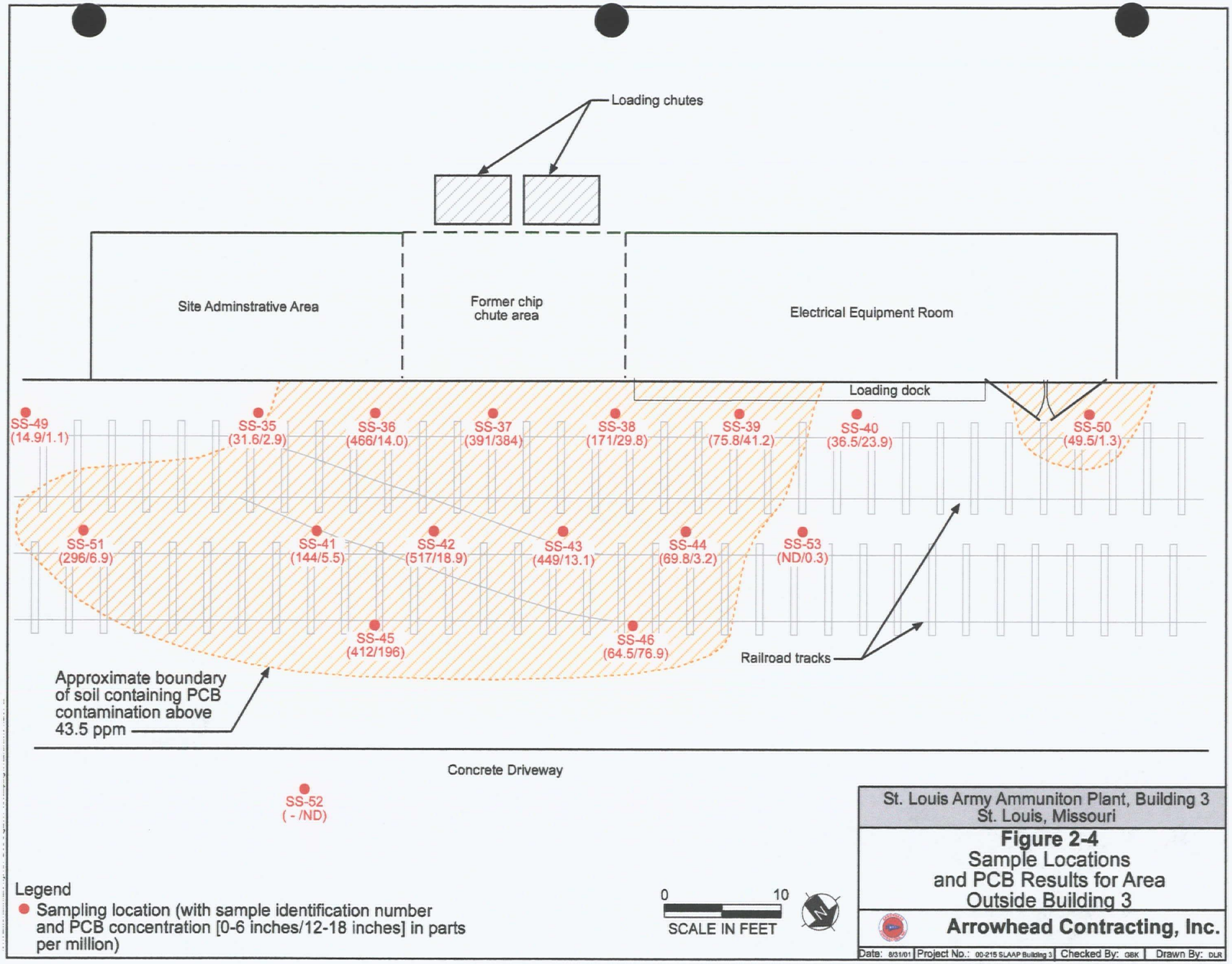
St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 2-3
Sample Locations
and PCB Results for Basement

Arrowhead Contracting, Inc.

Date: 8/31/01 | Project No.: 00-215 SLAAP Building 3 | Checked By: GWW | Drawn By: DLR

S:\ACI Environmental\Projects\SLAAP\Figures\basement oil stained areas with PCB contaminations.fh10 8/16/01 dlr



St. Louis Army Ammuniton Plant, Building 3
St. Louis, Missouri

Figure 2-4
Sample Locations and PCB Results for Area Outside Building 3

Arrowhead Contracting, Inc.

Date: 8/31/01 | Project No.: 00-215 SLAAP Building 3 | Checked By: GBK | Drawn By: DLR

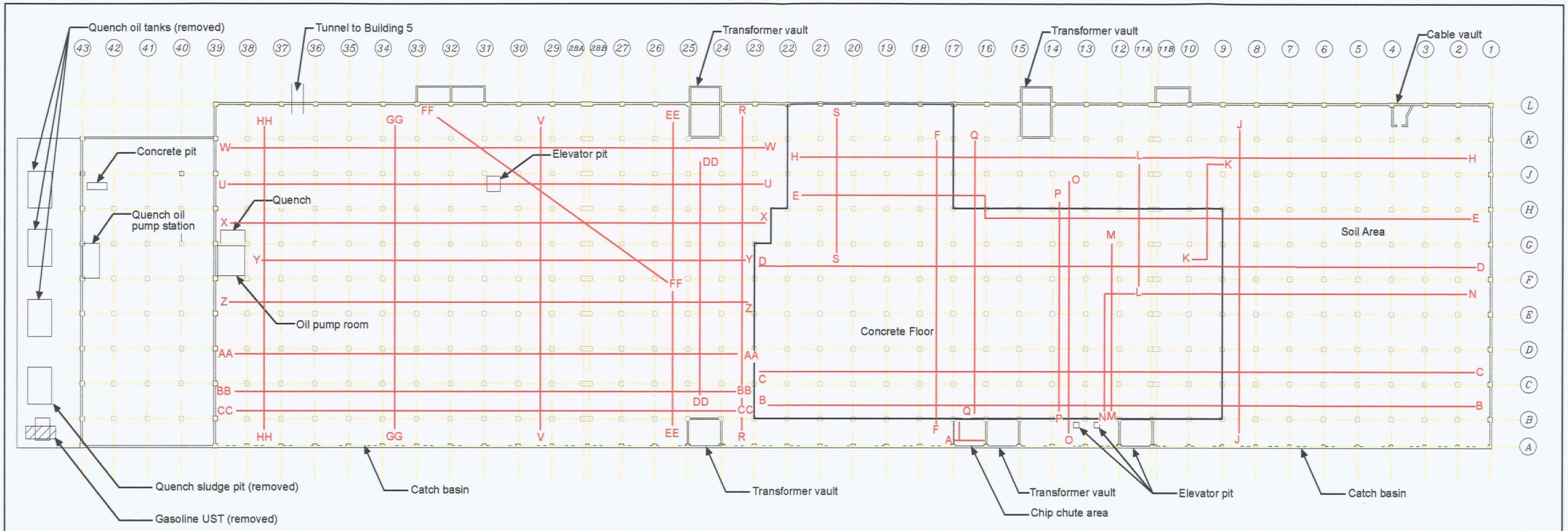


Table 1

Item	Pipe type, diameter, and quantity (outside diameter of all piping, inclusive of asbestos wrap)	Approximate Linear Feet
A	3" asbestos wrapped pipe (x1)	69
B	6" asbestos wrapped pipe (x2) 5" asbestos wrapped pipe (x1) 4" asbestos wrapped pipe (x2) 3" steel pipe (x1) 4" steel pipe (x2) 5" steel pipe (x1)	860 430 860 430 860 430
C	10" asbestos wrapped pipe (x1) 6" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x1) 4" asbestos wrapped pipe (x1) 8" steel pipe (x1) 2.5" steel pipe (x1)	430 430 430 430 430 430
D	5" asbestos wrapped pipe (x1) electrical wiring (x1)	430 430
E	5" asbestos wrapped pipe (x1) 4" cast iron sewer pipe (x2)	400 800
F	6" cast iron sewer pipe (x1)	170
H	6" asbestos wrapped pipe (x1) 6" electrical conduit (x1) 1" electrical conduit (x3) 4" PVC pipe (x1) 5" steel pipe (x1) 3" steel pipe (x1) 1" steel pipe (x1) electrical wiring (x1)	400 400 1200 400 400 400 400 400
J	14" asbestos wrapped pipe (x1) 12" steel pipe (x1) 4" steel pipe (x1)	180 180 180
K	4" cast iron sewer pipe (x1)	80
L	4" cast iron sewer pipe (x5)	375
M	4" cast iron sewer pipe (x4)	400
N	4" asbestos wrapped pipe (x1)	290
O	6" electrical conduit (x1) 5" electrical conduit (x1) 1" electrical conduit (x1) 4" cast iron sewer pipe (x2)	150 150 150 300
P	4" cast iron sewer pipe (x2)	250
Q	4" cast iron sewer pipe (x1)	165
R	12" asbestos wrapped pipe (x1) 6" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x1)	190 190 190
S	12" asbestos wrapped pipe (x6) 8" asbestos wrapped pipe (x1)	480 80
U	8" asbestos wrapped pipe (x2) 6" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x2) 4" asbestos wrapped pipe (x2)	640 320 640 640
V	8" asbestos wrapped pipe (x1) 4" asbestos wrapped pipe (x1) 6" cast iron sewer pipe (x1) 4" steel pipe (x2) 3" steel pipe (x1) electrical wiring (x1)	180 180 180 360 180 180
W	6" asbestos wrapped pipe (x1) 4" electrical conduit (x1) 4" PVC pipe (x1) electrical wiring (x1)	320 320 320 320
X	5" asbestos wrapped pipe (x2)	640
Y	8" asbestos wrapped pipe (x2) 6" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x6) 4" asbestos wrapped pipe (x2)	580 290 1740 580
Z	4" asbestos wrapped pipe (x1)	310
AA	3" asbestos wrapped pipe (x1)	300
BB	6" asbestos wrapped pipe (x1) 8" steel pipe (x1) 3/4" electrical conduit (x1)	300 300 300
CC	8" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x1) 4" asbestos wrapped pipe (x1) 3" asbestos wrapped pipe (x1) 6" electrical conduit (x1) 5" electrical conduit (x1) 4" steel pipe (x1)	300 300 300 300 300 300 300
DD	6" asbestos wrapped pipe (x1) 5" asbestos wrapped pipe (x2) 4" asbestos wrapped pipe (x1) 3" asbestos wrapped pipe (x1) 6" electrical conduit (x1)	140 280 140 140 140
EE	4" asbestos wrapped pipe (x2) 3" asbestos wrapped pipe (x1) 1" electrical conduit (x1)	360 180 180
FF	4" cast iron sewer pipe (x1)	170
GG	6" steel pipe (x1)	180
HH	8" asbestos wrapped pipe (x1) 3" asbestos wrapped pipe (x2)	180 360

Legend

Piping identified during initial sampling. Alpha character denotes pipe run identified in Table 1. Table 1 contains a description of type and quantity of indivdual pipe runs.

0 40 80
SCALE IN FEET

St. Louis Army Ammunition Plant, Building 3
St. Louis, Missouri

Figure 4-1
Piping and
ACM in Basement

Arrowhead Contracting, Inc.

Date: 8/31/01 | Project No.: 00-215 SLAAP Building 3 | Checked By: GWW | Drawn By: DLR

S:\ACI Environmental\Projects\SLAAP\Figures\basement piping layout.fh10 8/16/01 dlr

APPENDICES

Appendix A

MS/MSD Results for Samples Spiked with Aroclor-1248 at 50 PPM

Analytical Management Laboratories, Inc.
15130 South Keeler, Olathe, Kansas 66062
Phone: (913) 829-0101 • Fax: (913) 829-[illegible]
Operations Manager: klindquist@amlabinc.com
Quality Manager: smeeks@amlabinc.com

Certificate of Analysis

August 28, 2001

Mr. Scott Seigwald
Arrowhead Contracting
12920 Metcalf Suite 160
Overland Park, KS 66213
Phone: 913-814-9994
Fax: 913-814-9997

Client Project ID : SLAAP

Laboratory Work Order # Various

Dear Mr. Seigwald:

Per our discussion earlier in the month about MS/MSD, ten concrete samples were chosen at random to perform a matrix spike study. The samples were spiked at 50 ppm with PCB-1248. The results are on the following pages

If you have any questions regarding this report, feel free to contact me at (913) 829-0101.

Kendall L. Lindquist, MBA
Operations Manager

Analytical Management Laboratories, Inc.
15130 South Keeler, Olathe, Kansas 66062
Phone: (913) 829-0101 • Fax: (913) 829-1181
Operations Manager: klindquist@amlabinc.com
Quality Manager: smeeks@amlabinc.com

Certificate of Analysis

Arrowhead Contracting

Client Project ID : SLAAP

Laboratory Work Order # Various

Client Sample ID:	CF1-F14-23	Date Collected:	06/23/01
Lab Sample ID:	236935	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	47.9	96	47.3	95	1
DB-1701 Column	50	49.2	98	45.6	91	8

Client Sample ID:	CF2-E12-23	Date Collected:	06/25/01
Lab Sample ID:	237602	Date Received	06/27/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	45.4	91	46.0	92	1
DB-1701 Column	50	44.4	89	44.6	89	0

Client Sample ID:	CF1-F12-23	Date Collected:	06/23/01
Lab Sample ID:	237009	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	47.3	95	45.4	91	4
DB-1701 Column	50	48.6	97	47.0	94	3

Client Sample ID:	CF1-D08-01	Date Collected:	06/24/01
Lab Sample ID:	237054	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	46.2	92	43.6	87	6
DB-1701 Column	50	45.1	90	45.7	91	1

AmL
American Environmental Laboratories, Inc

15130 South Keeler, Olathe, Kansas 66062
Phone: (913) 829-0101 • Fax: (913) 829-1181
Operations Manager: klindquist@amlabinc.com
Quality Manager: smeeks@amlabinc.com

Certificate of Analysis

Arrowhead Contracting

Client Project ID : SLAAP

Laboratory Work Order # Various

Client Sample ID:	CF1-G31-23	Date Collected:	06/20/01
Lab Sample ID:	236202	Date Received	06/22/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	46.3	93	50.3	101	8
DB-1701 Column	50	47.1	94	47.9	96	2

Client Sample ID:	CF1-C17A-23	Date Collected:	06/22/01
Lab Sample ID:	236503	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	45.4	91	47.2	94	4
DB-1701 Column	50	43.3	87	45.2	90	4

Client Sample ID:	CF1-J525-01	Date Collected:	06/21/01
Lab Sample ID:	236225	Date Received	06/22/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	64.6	129	51.9	104	22
DB-1701 Column	50	63.9	128	52.9	106	19

Client Sample ID:	CF1-E17-23	Date Collected:	06/22/01
Lab Sample ID:	236630	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	47.9	96	47.8	96	0
DB-1701 Column	50	47.2	94	45.1	90	5

AML
Analytical Management Laboratories, Inc.
15130 South Keeler, Olathe, Kansas 66062
Phone: (913) 829-0101 • Fax: (913) 829-1181
Operations Manager: klindquist@amlab.com
Quality Manager: smeeks@amlab.com

Certificate of Analysis

Arrowhead Contracting

Client Project ID : SLAAP

Laboratory Work Order # Various

Client Sample ID:	CF1-K20-01	Date Collected:	06/22/01
Lab Sample ID:	236626	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	47.4	95	44.2	88	7
DB-1701 Column	50	49.2	98	47.4	95	4

Client Sample ID:	CF1-H08-01	Date Collected:	06/24/01
Lab Sample ID:	237044	Date Received	06/25/01

Matrix Spike/Matrix Spike Duplicate

Analyte	Amt. Spiked	Amount Found	MS % Rec.	Amount Found	MSD % Rec.	% RPD
AR-1248						
DB-5 Column	50	43.8	88	46.9	94	7
DB-1701 Column	50	44.3	89	48.9	89	10

Appendix B

Approval Letter for Discharge of IDW to City of St. Louis Sewer System

Metropolitan
St. Louis Sewer
District

Office of Environmental Compliance
10 East Grand Avenue
St. Louis, MO 63147-2913
(314) 436-8710
FAX (314) 436-8753

RECEIVED OCT

October 17, 2001

Scott Siegwald
ARROWHEAD CONTRACTING, INC.
12920 Metcalf, Suite 150
Overland Park, KS 66213

Dear Mr. Siegwald:

We have reviewed your application dated October 8, 2001 requesting approval to discharge 1,200 gallons of wastewater to the Metropolitan St. Louis Sewer District for treatment. This wastewater is cooling water from concrete core sampling and sampling equipment decontamination water at the building No. 3 of the St. Louis Army Ammunition Plant located at 4800 Goodfellow Boulevard, St. Louis, Missouri.

Based on the analytical results, this wastewater meets MSD Ordinance 8472 standards and is approved for discharge into a sanitary sewer on site, subject to filtration by the 15 micron fabric filter as indicated in your application. The discharge into the sewer must be controlled at a rate that will not surcharge the lines in that area. This approval is valid for 30 days from the date of this letter.

You must be certain the waste is discharged into a sanitary or combined sewer inlet only. This letter does not authorize any discharge to a separate storm sewer, or to any watercourse, as any such discharge would be in violation of state and federal laws. **Please notify me at the number below when the discharge is to commence.**

This discharge has been approved based upon the information and sample analysis you provided, and is subject to the conditions stated above. This approval may be revoked by the District at any time if any of the information is found to be incorrect, or if the conditions of this approval are violated. Also, if the discharge causes any operational or maintenance problem within the District's collection or treatment system, or results in violations of any conditions of the District's NPDES permit, Arrowhead Contracting, Inc. and the property owner, U.S. Army Corp of Engineers Aviation Missile Command, will be considered responsible for damages.

If you have any questions, please call me at (314)436-8742.

Sincerely,
METROPOLITAN ST. LOUIS SEWER DISTRICT

Roland A. Biehl

Roland A. Biehl
Environmental Associate Engineer

bv

pc: Bernie Rains

File: SD, St. Louis Army Ammunition Plant, 4800 Goodfellow Boulevard, St. Louis, Missouri

Appendix C

ACM Sample Results and Related Information

ASBESTOS CONSULTING TESTING

14953 WEST 101ST TERRACE
LENEXA, KANSAS 66215
(913) 492-1337
FAX (913) 492-1392

August 28, 2001

Arrowhead Contracting, Inc.
12920 Metcalf
Overland Park, Kansas 66213

Enclosed please find results for the bulk samples submitted to our laboratory for asbestos analysis.

The asbestos analysis was performed using Polarized Light Microscopy (PLM) with dispersion staining in accordance with the EPA test method for the determination of asbestos in bulk samples, EPA/600/R-93/116. The percentage of fibers is listed. The method of measurement is based on calibrated visual estimation. The data provided herein is related only to those samples submitted for analysis. Verification by PLM point counting is available upon request. Due to limitations of the PLM microscope and the matrix of floor tile, any floor tile sample found to contain NO asbestos may be verified by TEM analysis upon the client's request.

Samples comprised of greater than one percent (1%) asbestos are to be considered as an asbestos containing material.

This report may not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced, except in full, without the written approval of ACT.

If you have any questions, please contact me at 913-492-1337.

Respectfully submitted,

Tami L. Van

Tami L. Van
Laboratory Director

enclosures

Asbestos Bulk Analysis Laboratory Report

Asbestos Consulting Testing (ACT) 14953 W. 101st Terrace, Lenexa, KS 66215 (913) 492-1337 NVLAP ID#101649-0

Client Name: Arrowhead Contracting, Inc.
Address: 12920 Metclaf
Overland Park, KS 66213

REPORT NO.: B-32137
RUSH TAT
Project Name: 4800 Goodfellow Bldg. #3
Address:

Date sample collected: 8/23/2001
Collected by: Leland Sumptur
Submitted by: Leland Sumptur
Date sample submitted: 8/27/2001

Project No.:
Analyst: Tami Van
Analysis Date: 8/28/2001

Sample No.: 1
Layer No.:
Location of Material: Debris in dirt at H-16
Description of Material: Brown compact fibrous

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**75**	Cellulose	15	Bulk	10

Sample No.: 2
Layer No.:
Location of Material: Debris on floor at H-19
Description of Material: Tan fibrous granular

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**7**			Bulk	88
AMOSITE	**5**				

Sample No.: 3
Layer No.:
Location of Material: Debris on concrete pad at F-17
Description of Material: Tan granular

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**2**			Bulk	98

Sample No.: 4
Layer No.:
Location of Material: White fibrous powder
Description of Material: Debris in dirt @ H-15

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
AMOSITE	**7**			Bulk	88
CHRYSOTILE	**5**				

Sample No.: 5
Layer No.:
Location of Material: Concrete walk @ D-17
Description of Material: WIPE SAMPLE

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**Present** (3 fiber bundles total)			Bulk	N/A

* A portion of the sample was ashed for analysis. 10 mounts were made of each ash.

Analyst: TV Laboratory Director: Tami Van

Asbestos Bulk Analysis Laboratory Report

Asbestos Consulting Testing (ACT) 14953 W. 101st Terrace, Lenexa, KS 66215 (913) 492-1337 NVLAP ID#101649-0

Client Name: Arrowhead Contracting, Inc.
Address: 12920 Metclaf
Overland Park, KS 66213

REPORT NO.: B-32137
RUSH TAT
Project Name: 4800 Goodfellow Bldg. #3
Address:

Date sample collected: 8/23/2001
Collected by: Leland Sumptur
Submitted by: Leland Sumptur
Date sample submitted: 8/27/2001

Project No.:
Analyst: Tami Van
Analysis Date: 8/28/2001

Sample No.: 6
Layer No.:
Location of Material: Concrete walk under pipe run near column H-15, shelter
Description of Material: WIPE SAMPLE

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**Present** (7 fiber bundles total)			Bulk	N/A

* A portion of the sample was ashed for analysis. 10 mounts were made of each ash.

Sample No.: 7
Layer No.:
Location of Material: Concrete floor @ F-18
Description of Material: WIPE SAMPLE

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
CHRYSOTILE	**Present** (20 fiber bundles total)			Bulk	N/A
AMOSITE	**Present** (1 fiber bundle total)				

* A portion of the sample was ashed for analysis. 10 mounts were made of each ash.

Sample No.:
Layer No.:
Location of Material:
Description of Material:

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
				Bulk	

Sample No.:
Layer No.:
Location of Material:
Description of Material:

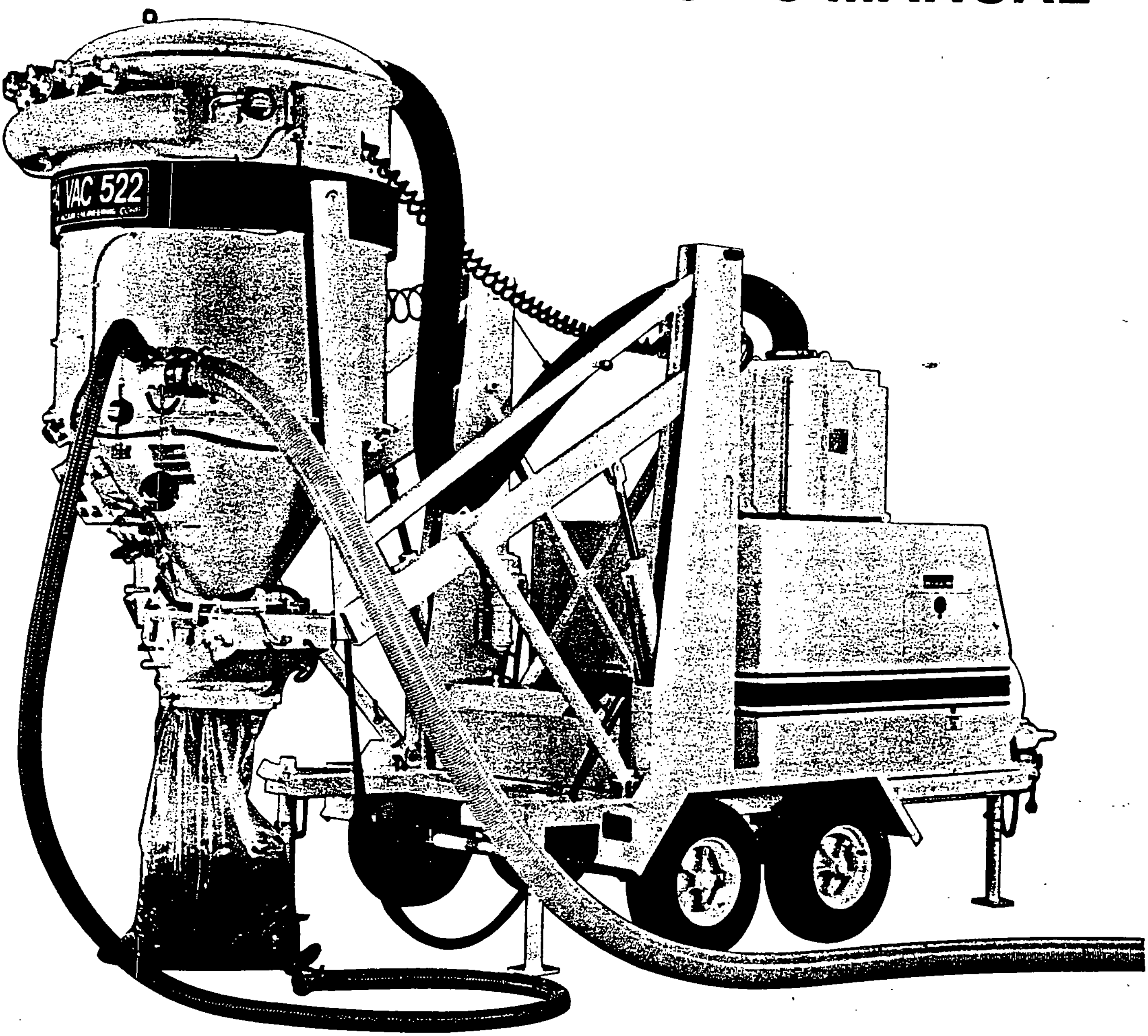
Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
				Bulk	

Sample No.:
Layer No.:
Location of Material:
Description of Material:

Asbestos Fibers	Percentage	Non-Asbestos Fibers	Percentage	Non-Fibrous	Percentage
				Bulk	

Analyst: TV Laboratory Director: Tami Van

VECLOADER HEPA VAC® 522
OPERATOR'S MANUAL



Vacuum
Engineering
Corporation

VECTOR

Performance Proven Vacuum Solutions™

US SPECIFICATIONS:
VECLOADER® 522™ VACUUM LOADER (DIESEL)

The VecLoader 522 is a versatile trailer-mounted industrial vacuum loader that never needs to be removed from the vacuuming site for dumping. It can be used for vacuuming coal, ash, dirt, dust, sand, stone, water and slurry utilizing a five inch diameter hose or multiple smaller diameter hoses. The VecLoader 522 offers rugged construction and powerful performance at a cost that will afford the owner a quick return on his investment. The trailer, along with vacuuming hose and accessories, can be moved by a one ton truck. Stationary and skid mounted systems are also available.

VACUUM PUMP:	Roots/Dresser Model 616 RCS-J, rotary lobe positive displacement blower.
PUMP RATING:	Rated vacuum of 15" Hg static pressure and 2,367 CFM.
PERFORMANCE:	Bulk dry materials will load up to 10-12 tons per hour/or at distances up to 500'
ENGINE:	John Deere industrial engine, model 4045T. (Electric powered models are available)
ENGINE RATING:	4-cylinder; water-cooled turbo diesel; Continuous 125 H P @ 2400 RPM
SPECIFICATIONS:	Belt drive through Rockford PTO; variable operating speeds between 1,000 to 2,400 RPM, mechanically governed; 12 volt electrical system; 15"/5 blade pusher fan, mounted on water pump; dry type air cleaner.
CONTROL PANEL:	Key start, temperature gauge, oil pressure gauge, ammeter, tachometer, air pressure gauge, and hour meter. High temperature and low oil pressure safety shut-downs, clutch engage/disengage control switch, pulse timer, vacuum timer and emergency stop.
FUEL:	Fuel: #2 Diesel, Fuel capacity – Two each, 50 Gallon tanks, Running time 8 hours (approximately).
COMPRESSOR:	Two stage, driven off the engine accessory drive; rated at 12 9 ACFM at 90 PSIG.
COLLECTOR UNLOAD:	Collector raises to a maximum height of 8'-6", centerline 6'-0" from the rear edge of the trailer. Controls are included for automatic, cyclical discharge of collected materials Collector has a pneumatic hopper vibrator and oiler When the cyclone collector is in raised position, it is upheld by rigid support arms Discharge is flanged to accept standard flanged gravity spout and other optional discharge valves
CYCLONE/BAGHOUSE:	Cyclone collector with 7/8 cubic yards in the conical storage section, flanged Baghouse contains 156 square feet of felted polypropylene cloth, continuously cleaned by reverse air pulses during the pulse cycle The pulsing of the bags is controlled by a pressure switch and solenoid valves. A magnehelic gauge shows the differential pressure drop across filters.
ADDED FILTRATION:	An additional filter with 185 sq ft of pleated cellulose microfiltration is on the blower providing final filtration and blower protection.
OTHER FEATURES:	Fiberglass enclosure to cover operating components for weather protection, locking latches on doors, regenerative air dryer with electric heater, H E.P.A. filtration available.
TRAILER:	Fully road-ready with tandem 6,000 pound axles, electric brakes, hand-operated parking brake, hydraulic jack for raising and lowering the trailer tongue, all lights for legal night highway operation, heavy-duty ring-type hitch, LT235-85R-16 radial tires mounted on six lug spoked rims Length: 17'-5", Width: 8' ½", Height 11'-2.5", Weight: 9,300 Lbs

Specifications subject to change without notice so that improvements can be made as quickly as possible

WARRANTIES, SERVICE AND RELIABILITY:
Manufactured, warranted and serviced by Vector Technologies Ltd., Milwaukee, Wisconsin. For over 20 years, Vector has been a leading innovator of hazardous and non-hazardous material handling equipment. The VecLoader Titan offers the same level of quality, innovation, reliability and field tested features that have made Vector vacuums the standard for reliability and performance in the a wide assortment of industrial markets. The VecLoader Titan carries a six month warranty backed by Vector Technologies and its elite roster of suppliers. Assistance is available via our U.S toll free hot line at 1 (800) 832-4010. Vector is fully dedicated to providing the finest "after-the-sale" service and support obtainable.

For more information, contact Vector Technologies at (800) 832-4010 In Wisconsin, or outside the United States, please call 1 (414) 247-7100 or fax 1 (414) 247-7110

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FEATURES AND GENERAL SPECIFICATIONS

GENERAL DESCRIPTION

The VecLoader HEPA VAC® is designed for rugged, reliable operation and is capable of powerful vacuuming with minimum daily maintenance. Any material, whether liquid, slurry, or solid and that will move through a 5 inch diameter hose, can be handled with this vacuum. See Figure 2 for an overall view of the VecLoader HEPA VAC®.

The VecLoader HEPA VAC® is a totally self-contained unit powered by a four cylinder diesel engine. It will provide excellent service if maintained properly. The HEPA VAC® contains no unique or complicated parts that require sophisticated maintenance procedures in normal operation.

The multistage filtration system consists of a first stage cyclone separator and a second stage watering system that the operator may use as required. These sections are followed by a specially designed filter bag house backed-up with an electrically monitored HEPA final filter.

The cyclone separator permits the dust free transfer of asbestos from the collection area to the disposal container. This separator is simple and easy to use. It consists of a discharge valve, a hydraulic auger and watering valves that control the discharge of material. Other controls and indicators enable the operator to monitor and regulate the flow of the collected material at all times.

The fiberglass engine enclosure has locking latches which permit safe, secure operation.

The tandem axle trailer is equipped with hydraulic surge brakes and a parking brake on the front axle. It can be easily towed and maneuvered with a one ton or larger truck.

Because of its mobility and ease of setup, the VecLoader HEPA VAC® is an extremely flexible and effective industrial cleaning vacuum. As long as you follow the recommended procedures outlined herein, the HEPA VAC® can be a versatile machine with almost limitless operations.

MAJOR COMPONENTS DESCRIPTION

See Figure 2 which illustrates the main components of the VecLoader HEPA VAC®.

1. Cyclone Separator - Vacuumed material is collected in the cyclone separator where the first three stages of air filtration also occur.

2. HEPA Filter - Removes 99.99% of all particles greater than 0.3 microns in size from the cyclone separator air. The cyclone filtration, with the HEPA filtration back-up, allows the HEPA VAC® to meet or exceed all National and State regulations pertaining to air moving equipment designed to handle air contaminated with asbestos.

3. Discharge Valve - A manually operated valve which controls the flow of asbestos into the collection bag. In the closed position, the valve initiates or allows completion of a vacuum cycle. In the opened position, the valve controls an hydraulic auger which helps to speed the discharge of sticky material.

4. Chassis - Made of heavy gauge sheet and steel tubing. An integral part of the HEPA VAC®, the chassis is equipped with tandem axles, surge brakes, a parking brake, towing hitch, and hydraulic jack.

5. Fuel Tanks - A 50 gallon diesel fuel tank is mounted at the front and rear of the chassis.

6. Hydraulic Oil Reservoir - Supplies oil to the hydraulic pump, the trailer cylinder, two cyclone separator cylinders, and a hydraulic motor.

7. Blower - Generates the vacuum to draw the material through the hose line.

8. Engine - Supplies power to the HEPA VAC®.

9. Compressor - Generates air at high pressures to be used for cleaning the cyclone separator filter bags and performing control functions. Can be used for tire and other maintenance.

10. Water Nozzles - Inject water into the cyclone separator inlet, cone and discharge valve, to moisten the collected material for safe transfer to the asbestos bag.

11. Vacuum Hose - Used for material removal at site. Usually nonmetallic, flexible, 5 inch diameter, and with steel couplings.

12. Instrument Panel - Contain the controls necessary to run the engine and monitor its condition. Also, houses the hydraulic controls for elevating the chassis and the cyclone separator.

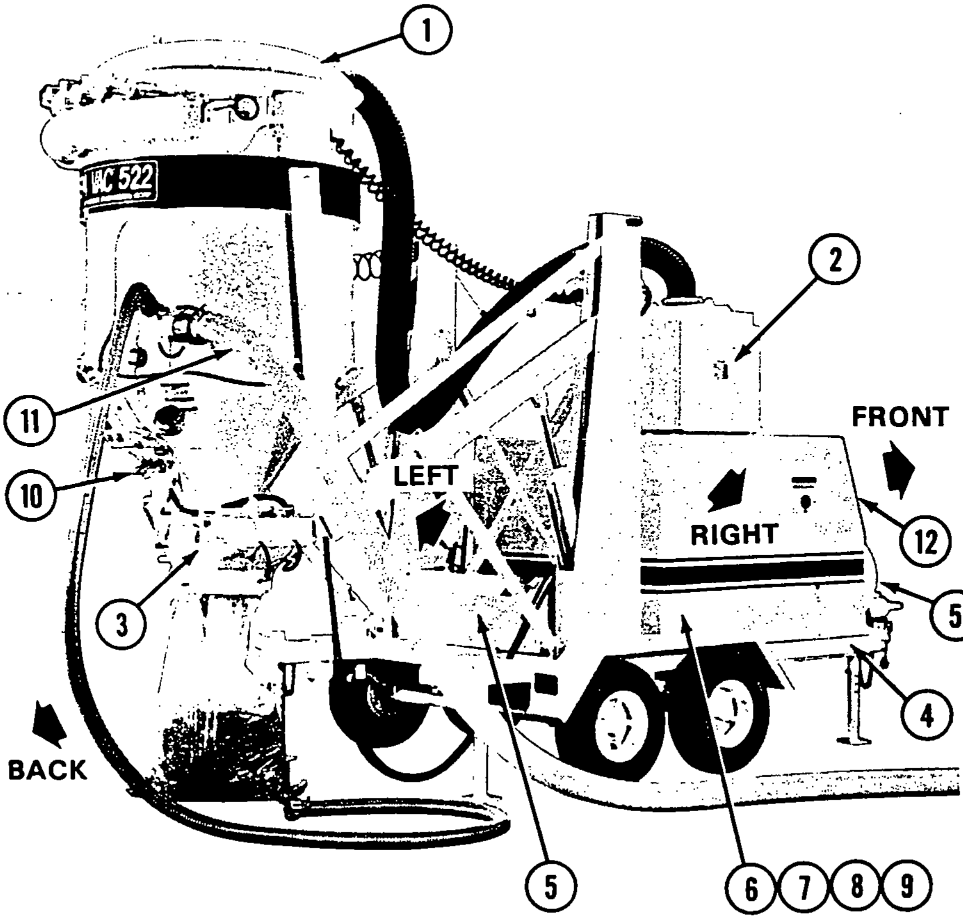

Figure 2. VecLoader HEPA VAC®

Scott,

SKETCH of DECON + LOAD out. You will ALSO NEED WATER supply + SM. hot WATER tANK for shower which IS REQUIRED. LELAND, SAID he would be getting PRICES for you. Shower H_2O will ALSO NEED to be filtered before you RUN shower H_2O into DRAIN.

GLENN

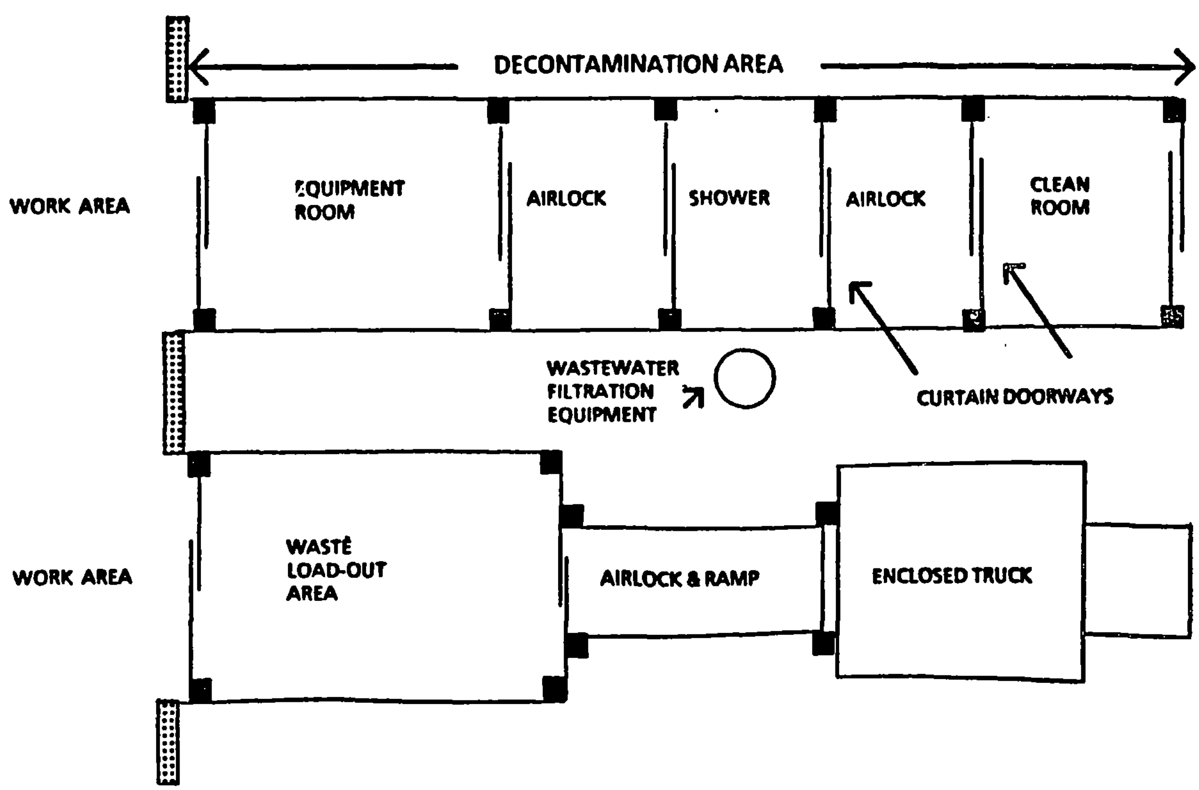

FIGURE X-1
SKETCH OF TYPICAL DECONTAMINATION AREA AND WASTE LOAD-OUT AREA